

**THE RAILWAY GAZETTE**  
A Journal of Management, Engineering and Operation  
INCORPORATING  
Railway Engineer • TRANSPORT • The Railway News  
The Railway Times • Herapath's Railway Journal • RAILWAY RECORD.  
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## DIESEL RAILWAY TRACTION SUPPLEMENT

The November issue of THE RAILWAY GAZETTE Supplement, illustrating and describing developments in Diesel Railway Traction, is now ready, price 1s.

## GOODS FOR EXPORT

The fact that goods made of raw materials in short supply owing to war conditions are advertised in this paper should not be taken as an indication that they are necessarily available for export

## DISPATCH OF "THE RAILWAY GAZETTE" OVERSEAS

We would remind our readers that there are many overseas countries to which it is not permissible for private individuals to send printed journals and newspapers. THE RAILWAY GAZETTE possesses the necessary permit and machinery for such dispatch, and any reader desirous of arranging for copies to be delivered to an agent or correspondent overseas should place the order with us together with the necessary delivery instructions.

We would emphasise that copies addressed to places in Great Britain should not be re-directed to places overseas, as they are stopped under the provisions of Statutory Rules & Orders No. 1190 of 1940, and No. 359 of 1941

## ANSWERS TO ENQUIRIES

By reason of staff shortage due to enlistment, we regret that it is no longer possible for us to answer enquiries involving research, or to supply dates when articles appeared in back numbers, either by telephone or by letter

## TO CALLERS AND TELEPHONERS

Until further notice our office hours are:

Mondays to Fridays 9.30 a.m. till 3.45 p.m.

The office is closed on Saturdays

## Paper Salvage and Transfer Deeds

ONE of the difficulties which results from the many-sided demands of the war is that of conflict of duty. At the present time there is urgent need to secure a considerably greater tonnage of wastepaper than ever before, in order to meet the needs of munition manufacture which are actually involving the use of valuable shipping space to bring wastepaper from America. Despite this need, directors and secretaries of companies are naturally hesitant to part with records to assist the paper salvage campaign for fear of failing in their legal duty to their shareholders. It should therefore prove a valuable aid to this paper salvage drive that the Board of Trade made on November 11 a new Defence Regulation (S.R. & O. 1941, No. 1778) the effect of which is to protect a company from any liability in respect of the destruction of transfer deeds of its securities at any time not earlier than three years after the transfer had effect, so long as the officers of the company act in good faith and without notice of any claim to which the transfers may be relevant. The regulation applies to documents transferring the company's shares, stock, bonds, debentures, and debenture stock. In view of paper shortage, the Board of Trade hopes that directors will take full advantage of the protection afforded by this regulation and will make available as wastepaper the accumulation of transfer deeds which it has frequently been the practice to retain for long periods. We may add a personal note to say that THE RAILWAY GAZETTE has contributed to the paper salvage campaign the whole of its out of date ledgers not legally required to be retained, and we hope that our readers will feel moved to take similar steps—and promptly—as a further contribution to the war effort.

## Lord Leathers on Reduced Passenger Services

When Lord Leathers addressed the members of the Institute of Transport at its luncheon meeting on November 12, he was the first Minister of War Transport to do so, although 13 of the 14 Ministers of Transport had preceded him at functions of this kind. He was able to give members of the institute welcome news of the transport of supplies to Russia, and of the part which transport is playing in the war effort, declaring that in the transformation of transport from an instrument of peace to an instrument of war considerable progress had been made. He said that old ideas of priorities had had to be brushed aside, and as an indication of how far the curtailment of passenger facilities had gone already, he said that the average frequency of main-line services was about 25 per cent. less than in peacetime. He went on to warn his hearers that in order to cope with the greatly increased pressure on our railways during the winter a further general curtailment of passenger services was inevitable, and that those restrictions might be severe on sections of the line where the pressure was greatest. He said, too, that the railways this year had already run 30,000 special military trains and 8,500 special coal trains, and that now they were carrying more coal for consumption in this country than at any time in their history.

## An Intensive Wagon-Building Effort

A striking indication of what can be done under the pressure of necessity has just been given by two Southern Railway Company's works, which in 10 weeks have completed the construction of 1,000 open 12-ton wagons; brief details were given in THE RAILWAY GAZETTE last week, and the matter is dealt with at greater length at page 530. The wagons have been sent to the Persian Gulf where they will be used to reinforce railway facilities for getting supplies to Russia; each of the wagons has been packed in sections which are numbered for easy and speedy re-erection. Apart from the value to our Russian allies of so rapid a supply of essential rolling stock, the manner in which the work has been performed at a time when railway workshops are already very heavily engaged on essential production and maintenance, is a striking testimony to the ability of British craftsmen to rise to an occasion of this kind. The handling of

this wagon order is of first class importance from a viewpoint wider than that of the war, for it is an example of what can be done to meet overseas demands for rolling stock. These wagons for Persia should provide a splendid advertisement in overseas markets for Great Britain which will have its full effect after the cessation of hostilities.

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### Preservation of Goodwill

On a number of occasions we have stressed in these columns the vital necessity for maintaining goodwill in foreign markets with which it is not possible in present circumstances to keep up regular trade relations. In the current issue of *The Times Trade & Engineering* this matter is stressed, and it is pointed out that the less feasible it is to deliver goods the more necessary it becomes to remind customers of them in order to facilitate trade revival after the war. Out of sight is too often out of mind, and goods no longer displayed in shop windows are likely to be forgotten unless some alternative for the shop window is adopted. Papers which still circulate in allied and neutral countries can carry a message to all the literate members of the public there; that message may be a mere reminder or it may contain an interesting illustrated story of progress and development. It is not possible to enunciate a general rule of universal application; each undertaking must adapt its policy to the special circumstances of its business. Broadly, however, it may be said that if goodwill is to be maintained the less it is possible to sell the more it becomes necessary to advertise. The selection of media in the choice of copy are matters for the individual, but advertising should be persistent. The day to abandon advertising will be the day when all hope of regaining commercial prosperity has fled.

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### U.S.A. South-Eastern Railways' Bright Outlook

During the third quarter of 1941, railways in the south-eastern group of United States roads secured unusually high earnings, and the larger systems, contrary to recent experience, made a net profit. The group as a whole, therefore, entered the last quarter with the most favourable traffic outlook since the pre-slump 1920's. Although the completion of some of the defence projects that have helped to raise the summer earnings abnormally may reduce these particular profits in the last quarter to a figure below that for the last quarter in 1940, the great bulk of the passenger and freight defence traffic is expected to continue at a high level, and there are likely to be other compensating sources of defence revenue as well as the normal annual upward trend in ordinary commercial traffic at this time of year. Agricultural and horticultural products and manufactures in the south are, moreover, expanding steadily. Reduction in coastwise steamer traffic will also tend to send a larger share of the citrus crop by rail. There will, however, be little diminution in road lorry competition, and the tobacco traffic will be lighter. It is expected that passenger traffic to Florida will be greater than ever this winter, and troop movements and visitors to camps are likely to keep passenger revenues high throughout that season.

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### The Reichsbahn and the Eastern Front

The strain of transporting and supplying a large army on a front stretching from the Arctic to the Black Sea has doubtless greatly taxed the German railway system, or at any rate its equipment, and most probably the alternation between intensive drives and pauses in the German attack on Russia may be attributed very largely to the transport situation. In fact, Hitler made some reference to this in his Munich beer garden anniversary speech when he cited the necessary organisation of transport facilities as one of the reasons why attacks at particular points were sometimes not pursued more intensively. A recent report from an American source says that the Reichsbahn has had to allocate part of its available rolling stock for use on the captured Soviet railways, as only relatively small numbers of Soviet locomotives and goods vehicles have fallen into the hands of the advancing Germany Army. In order to establish through traffic between the Reich and the Eastern

Front, the Germans decided to convert the 5-ft. gauge of the Russian railways to the European standard of 4 ft. 8½ in. by moving one of the rails and replacing the points. This work, it is claimed, has been accomplished successfully on the greater part of the captured Soviet railways, but apparently the large number of bridges blown up by the retiring Russian Forces continues to hamper railway transport in the occupied territories. The withdrawal of rolling stock from Germany for use in occupied territories of the Soviet Union has accentuated traffic congestion in the Reich, and the shortage of some goods is considered to be due more to the difficulty of moving available stocks to centres of consumption than to exhaustion of supplies.

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### Oil Burning History

The recent conversion to oil-burning of the score of 2-10-0 freight locomotives on the North Western Railway of India, originally built about 20 years ago by the North British Locomotive Company for the G.I.P.R., makes apposite a brief reference to early oil-burning tests and applications. Experiments were made on the Eastern Railway of France in 1870, and eight years later Urquhart began in Russia on the Tsantsin Railway what was the first large-scale use of oil-burning locomotives. Holden's first oil-burner on the Great Eastern Railway, the 2-4-0, *Petrolea*, was set to work about 1887, the idea being to use waste oil then being turned into the River Lea. The Roumanian railways conducted experiments in 1888 which led to a fairly wide use of oil-burning steam locomotives in that country. Until the beginning of this century most of the oil production in the U.S.A. was centred on Pennsylvania, Ohio, and Virginia, and not unnaturally the earliest tests were conducted in that area, the Pennsylvania Railroad being first in the field in 1887. Almost at the same time one of the constituent companies of the present Atchison, Topeka & Santa Fe Railway began experiments, and after the development of the Californian and Texas oilfields, beginning in 1895 and 1900 respectively, oil-burning locomotives came to the fore in the south and west, particularly on the Southern Pacific Railroad. Among the latest developments in this connection is the conversion of a number of standard W.D. 2-8-0 locomotives from coal to oil burning for service in the Middle East, as described at page 469 of our November 7 issue.

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### Mail Services in Eire

As there is now on the Great Southern system only one passenger train a day in each direction (except in the case of suburban services), the timetable has had to be arranged in the way most suitable to the travelling public, practically without regard to the service for mails. Formerly there were early morning and night mail services in each direction over the system. To endeavour to overcome to some extent the withdrawal of the night trains, arrangements were made to send the night mails by night goods trains, which are scheduled to arrive at their destinations many hours before the passenger trains of the next day, but due to the quality of the coal available the goods trains have been upset in schedule and the benefit of the additional facility has, unfortunately, been minimised in many cases. The position became so acute on the main line between Dublin and Cork that on Friday last (November 14) the down night mail service from Dublin to Cork was resumed. Mails for main-line offices are conveyed, and mail connections are given to the Limerick, Waterford, and Tralee sections, and also to the Bandon, Skibbereen, and Cobh and Youghall lines. Outgoing night mails are despatched from Waterford by train leaving at 7 p.m., and from Limerick by train leaving at 9 p.m. Correspondence contained in these mails secures delivery in Dublin on the next afternoon. There was previously a night mail despatch from Cork by train at 6.30 p.m. falling into the same delivery.

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### The Double Yellow Aspect for Permissive Signals

We referred in an editorial note in our issue for August 29, 1941, page 206, to the use by some American lines of automatic signals on up grades, arranged so that no stop aspect

was exhibited, allowing trains to pass permissively and avoid unnecessary stops with very heavy loads. An interesting example of this is provided by a recent installation on the Union Pacific Railroad between Cheyenne and Buford, a distance of about 28 miles, where there is a continuous up grade of about 1 in 72. On the down grade ordinary three-aspect signals are installed, but in the rising direction the red light is not used, the lens corresponding to it not being provided with a lamp. The green and yellow aspects have the usual meanings, but when the section immediately in advance of a signal is occupied the yellow signal unit is still lighted, together with an additional one, also yellow, mounted below, over which is a signboard bearing a letter "P" (permissive). Light-out arrangements are provided to prevent only one yellow light being seen when two should be showing, with appropriate action on the signal in rear. Several other lines in the U.S.A. work heavy grades on these principles, but there is great lack of uniformity in the signal and "marker" aspects used.

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### Striking Roller Bearing Results

In the course of an informative paper entitled "Progress in Steam Passenger Locomotive Utilisation," read at a meeting of the American Society of Mechanical Engineers, the author, Mr. A. A. Raymond, Superintendent of Fuel and Locomotive Performance, New York Central System, gave some detailed particulars of the performance of locomotives equipped in varying degrees with roller bearing axleboxes. About 1929, the application of roller bearings to engine bogies began on a considerable scale, and in 1934 nearly all new high-speed passenger locomotives in the U.S.A. had bogies so equipped. At that time more than 14,000,000 miles a year were run by such engines, with no delays chargeable to the bearings, and during 1940, with over 19,000,000 miles there were also no delays. In the last five years the engines with roller-bearing bogies completed approximately 90,000,000 miles with only two delays due to bearings, which gives an average of 45,000,000 miles for each stop; whereas in the first five years of the report, starting in 1927 when all engine bogies were fitted with plain bearings, the miles per delay averaged approximately 500,000, which means that the roller bearings decreased the liability of delays no less than 90 times. A natural enquiry on the part of those interested would be as to how the New York Central fared with the engines it has equipped with roller-bearing coupled-wheel axleboxes. Mr. Raymond answers this by stating that over an eight-year period there were 3,376 delays with plain bearing driving boxes, or an average of 47 a year, and, with an annual mileage of approximately 14,000,000 this would mean 297,000 miles per delay. Roller bearings during the same period showed no delays in traffic, although for the last three years the engines, 58 in number as against 196 with plain bearings, averaged 6,626,150 miles a year.

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### Scope for Temptation

By now it seems that the dispossessed suburban first class passenger must resign himself to doing without his extra space and privacy, and even join with a sickly grin in the general jubilation at his discomfiture. This jubilation is largely led and inspired by newspaper writers who, we suggest, ride to their offices in their own cars. Every normal regular suburban passenger must at times have dreamed of travelling first himself, however irritating the large and moon-like faces of the first class *habitués* may have seemed on occasions, when they floated past him in their once inviolate compartments. However, these were wicked desires of which today we should be ashamed. We must, it seems, have no more Dick Whittingtons, making their pile and then parading it before their former associates by riding in state coaches. Even so, we do not doubt that if the Evil One desired to capture some additional victims, he could reap a merry harvest any morning on a suburban station by offering first class accommodation to the waiting crowds. Let us peer carefully in future beneath the brim of the stationmaster's top hat to see that no horns are sprouting there, and keep a sharp lookout for cloven hooves capering beneath the official spats.

## Inception of Interlocking in India

THE first signalling and interlocking equipment introduced in India in 1878 and brought into use next year took the form of installations at six stations between Lonavla and Poona on the Great Indian Peninsula Railway main line from Bombay towards Madras. The line was then single, and the system devised by Sir George Berkley, the company's Consulting Engineer, and Mr. Wilson Bell, its Chief Engineer, in collaboration with the London firm of Saxby & Farmer, embodied a form of indirect interlocking; it was described in a paper by Mr. C. W. Hodson to the Institution of Civil Engineers in 1909. The installations, which cost £6,105, gave good service for 29 years and were replaced only when the line was doubled in 1908. In 1878 the desirability of extending the use of interlocking to the northern main line was also advocated in order that "the timing of the mail train might be curtailed," but for financial reasons this matter was not taken up for another 17 years. In 1899 the East Indian appointed Mr. S. T. Dutton as Signal Engineer, and the G.I.P.R. appointed Mr. I. W. Stokes, then on the Great Western, in 1903. About 31 G.I.P.R. stations had by then been equipped with different forms of signalling and interlocking, of which, however, only 13 had cabin interlocking, installed in a total of 30 cabins. Examples of the latter were met with at the old Victoria terminus, Bombay, at a few stations in the suburban area on what was then double line, and on the two Western Ghat sections. The cabin interlocking was of the type usual in Great Britain. The main reason for the appointment of a Signal Engineer was the desire to push on with the provision of interlocking at stations, and especially the crossing stations on single lines. Of the 958 miles between Bombay and Delhi, 605 miles were then—in 1903—single line, and only about 12 crossing stations had been partly interlocked. The question had been under discussion since 1895, but nothing had been done. The great difficulty was to decide how the stations should be signalled and what type or system of interlocking should be adopted; whether it should be one of the indirect key systems in use, or being installed, on two or three other railways in India at that period, or some other system.

By 1898 Indian signal aspects and indications had fallen into such confusion that Mr. Hodson, then Director of Railway Construction, initiated a discussion on a uniform system. Various draft rules and suggestions were tried out on the East Indian Railway during the years 1902 and 1903. As these proved quite satisfactory the Government finally, in 1904, laid down the general signalling principles to be adopted by all railways. How the G.I.P.R. stations were to be signalled was thus settled; there still remained, however, the important question of the type of interlocking to be adopted to give effect to it. Individual engineers on several different railways had designed a "simple, cheap, and efficient system of signalling," in all cases of the indirect key type, to suit the requirements of Indian crossing stations and the operating conditions of that time. The apparatus was made locally and, had not some general managers discouraged the inventive efforts of their officers, matters might have ended with every railway possessing at least one patent key system of its own. Probably the best known of these systems were the List and Morse—invented by two engineers of the North Western Railway in 1895 and afterwards largely installed there, on the Eastern Bengal and on the old Oudh & Rohilkhand Railway—and the Dutton, installed on the East Indian and Bombay, Baroda & Central India Railways. The Dutton system was not, however, a key apparatus, in the ordinary sense, as the keys did not perform the interlocking, but were used as tokens, to enable the stationmaster to satisfy himself that his orders had been carried out and to prevent unauthorised interference. Most of these systems were reasonably efficient for small stations with simple layouts. The train service was light and speeds low, train crossings were infrequent and pointsmen's wages small. The necessity for employing several pointsmen, and the delays when trains were crossed, due to men having to walk about with keys—especially where succession locking was provided—mattered little. The type of key used was not, however, proof against



being tampered with. One stationmaster had a duplicate set of keys made to save himself from walking down to the points! Under present day conditions, these "economical" systems have, in the opinion of many, ceased to be economical. Their sole merit, cheapness in construction cost, is now offset by their unsuitability for unrestricted speed, slowness of operation, and other disadvantages. The G.I.P.R. had an economical indirect key system, designed by Mr. J. M. Wrench and installed about 1897 at some 12 stations on the Indian Midland Railway. In 1902, when—after the amalgamation of this system with the G.I.P.R.—Mr. Wrench was Chief Engineer of the combined railways, he much improved his system to suit the requirements of the G.I.P.R. In 1903 it was proposed to instal this system, with improvements made by Mr. Stokes, at 97 crossing stations, the fifth scheme to be considered since 1898. It was said to be "quite up-to-date and efficient" and to cost only about one-third of cabin interlocking. Government sanction was actually given to the G.I.P.R. in 1904 to go ahead with this further improved economical system at 63 crossing stations, but a month later this sanction was cancelled.

In 1905, however, Mr. F. T. Rickards, then General Manager, suggested to the Railway Board that it was not worth while to adopt a cheap form of interlocking which would have to be scrapped whenever additional facilities were provided, or the line doubled. As an alternative, he advocated the English type of interlocking, which, though costing about twice as much, lent itself to extension and doubling, and he recommended the installation of this type of interlocking at 158 stations at a cost of £123,458. After some delay and much discussion a modified scheme was sanctioned by the Railway Board, and some 35 stations were accordingly interlocked. As, however, in 1907, the Government Inspector considered that—unlike the original scheme—this modified interlocking did not comply with the revised General Rules of 1906, a further scheme had to be prepared. The final revised estimates amounted to £133,068 for 125 stations, this number being reduced from the original 158 because of the elimination of a number of stations where doubling was either in hand or expected shortly to be done. The increased cost was due to the provision of cabins instead of open frames, and to all lines having separate homes and starters; also there seems no doubt that the original scheme had been under-estimated. The work was carried out between 1908 and 1912 and provided a widespread form of single line cabin interlocking which, though the pioneer of its type in India, is suitable for unrestricted speed on main lines even today. Some details of the work on the Great Indian Peninsula Railway are described in an article on page 524.

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### Traffic and Track Inspection

**T**WO serious derailments, within twelve days of each other, on one American railway have brought into prominence the whole practice of track inspection in that country. Both accidents were caused by the breakage into a number of pieces of rails containing transverse fissures. In the first of them the Tamiami express (train No. 71) was derailed on straight and level track on the main line of the Atlantic Coast, at O'Neal, between Jesup and Jacksonville, while travelling at 72 m.p.h., or well within the authorised maximum of 80 m.p.h. The initial failure occurred within the fishplate area at the lead-on end of the rail, owing to a fissure which extended to 95 per cent. of the cross-sectional area of the rail, but had not come to the surface of the rail at any point before fracture. In the length of the rail concerned, which was of the 100 lb. flat-bottom section, 39 ft. long, laid new in 1929, there were ten other clean breaks, none of which, singularly enough, showed any sign of fissuring; and a still more curious feature of the derailment was that evidence clearly pointed to the fact of the rail having broken and separated prior to the passage over it of the train involved. The last previous train was a freight, about one hour earlier, but the crew of the latter testified that they had noticed nothing unusual while passing over this length.

The second derailment, twelve days later, was of the east-bound South Wind, one of the three streamlined expresses

introduced this year on the Chicago—Florida service, near Dupont, Georgia, again on straight track. Here also 100 lb. rail was in use, laid new in 1927 in 39 ft. lengths, and the transverse fissure that was the primary cause extended to 75 per cent. of the rail-head. But in this instance that rail had already been broken through for some time, save for two small areas at the top of the head and at the lower part of the foot—a breakage that would be clearly visible to external scrutiny. This fracture was within 12½ ft. of the running-off end of the rail, and was succeeded by six additional fractures in the next 11½ ft., all but one of which revealed transverse fissures. The line concerned is single track and the South Wind was moving over it at 60 m.p.h., or within the authorised limit of 62 m.p.h.; and here again there was evidence that at least two trains had passed over the rail in its broken condition before the derailment occurred. For this evidence related to a train running in the opposite, or west-bound direction, which would be at least 8 hr. earlier, and between that and the South Wind there had been another eastbound train.

Both rails were rolled before the introduction of controlled cooling. The last patrol of a Sperry detector car over the O'Neal rail was 14 months before the derailment, and no defective condition had then been revealed; the section on which the Dupont failure occurred had never had a detector car over it. As to regular track inspection, although the Interstate Commerce Commission investigator reported that the main-line track at O'Neal was well maintained, his enquiries elicited the fact that the foreman in charge of this length inspected the track only two or three times a week, a special inspection being also carried out weekly on Saturdays by the roadmaster of the division, travelling in a motor inspection car, notwithstanding the fact that high speed streamline services use this route daily. At Dupont, it was admitted, track inspection is confined entirely to a single motorcar trip once weekly, at a speed of 18 to 20 m.p.h., which would, of course, give little or no opportunity of discovering any such abnormality as a crack in the surface of a rail.

This motorcar method was one evolved in the interests of economy during the years of the depression, when, particularly on subsidiary main lines and branch lines conveying little traffic, such as that through Dupont, motorcar patrolling was substituted for the previous trackwalking, so multiplying by six or seven the length of track which could be covered in a given time by a surfaceman, and at the same time releasing many highly skilled men for more productive work. But since the depression the old traffic conditions have returned and have, indeed, been intensified, particularly in the matter of speed. The Interstate Commerce Commission, in reporting on these accidents, makes it clear that the inspection methods just described are not regarded as adequate in present conditions, either for the speeds of 80 m.p.h. on the high-speed main line or for 62 m.p.h. on the subsidiary line. From the evidence reviewed, it seems clear that both rails must have been in a completely fractured condition for an appreciable time before derailment occurred, so that there would have been a reasonable chance of averting both accidents had trackwalking been still operative. "In fact," comments our American contemporary *Railway Engineering and Maintenance*, "the very same factors that wisely called for adjustment downward in the intensity of track inspections during the depths of the depression are now developing in the reverse direction, a fact which railway maintenance officers cannot afford to overlook under the pressure of their greatly enlarged work programmes and responsibilities." Precisely the same problem will face those responsible for the maintenance of British tracks when the demand for high speed is resumed in the post-war reconstruction, though fortunately it is not likely to be aggravated here by the menace of the transverse fissure.

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**NEW AIR SERVICES FOR THE BRITISH WEST INDIES.**—A new weekly aeroplane service, operated by the Royal Dutch Air Lines, connecting Kingston (Jamaica) with Curacao, Aruba, and Trinidad, was begun on August 19. Air transport between Jamaica and the U.S.A. has been improved, with three planes a week now in each direction instead of two as formerly.



## LETTERS TO THE EDITOR

(The Editor is not responsible for the opinions of correspondents)

### A Salvage Suggestion

Salvage Department, Ministry of Supply,  
Gt. Westminster House, Horseferry Road, S.W.1  
November 17

TO THE EDITOR OF THE RAILWAY GAZETTE

SIR,—Britain's heavy industrial organisations are responding splendidly to the Nation's call for salvage, particularly waste paper, but may I appeal through the medium of your valued journal for a still greater effort.

The need for more and more waste paper is urgent. Nothing is too little. Even an old envelope will make a cartridge wad. Thousands of tons of paper are being used in the making of radio for our tanks and bombers, radiolocation instruments, shell containers and fuse components, dust covers for aero engines, aero-cannon shell boxes, Admiralty and land mines, partitions in army huts and war factories, and gaskets for petrol engines, etc.

May I take this opportunity of asking your readers to consider an "A" and "B" plan for salvage?

Many concerns have in store a great deal of old correspondence, files, books, and documents. These could be divided into "A" and "B" groups—the essential which must be retained and non-essential which can be dispensed with for salvage.

The first thing to do is, of course, to sift all the material which has been gathered over the years, keeping only those books, documents, and other things which have to be preserved for a statutory period or because they are of special importance or historical value. These will go to the "A" group and the rest will go to the "B" group for disposal for salvage.

When all this paper from the past has been sorted out, the "A" and "B" plan can be worked on a daily basis. As documents, correspondence, accounts, and so on, come in and are dealt with, those things which must be retained for a time, and are therefore considered essential, will be put to the "A" group and everything else will go to the "B" group for salvage.

Any material which can be allocated to salvage will be collected by your local council or voluntary organisations, or can be sold to a waste paper merchant, but in the event of any difficulty a postcard to the council office will, I am sure, receive prompt attention.

H. G. JUDD,  
Controller of Salvage

### Locomotive Improvements

20, Yewstock Crescent East,  
Chippenham,  
Wiltshire  
November 10

TO THE EDITOR OF THE RAILWAY GAZETTE

SIR,—I was very interested to see the letter from Colonel P. M. Brooke-Hitching in your issue of October 31, suggesting that more extensive trials of poppet valves might be undertaken in this country.

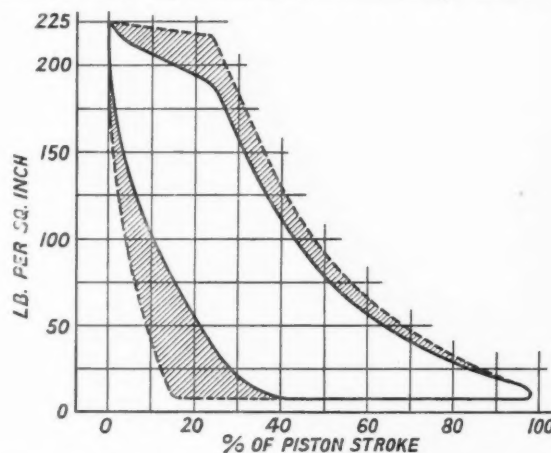
A significant part of Mr. Stanier's presidential address to the Institution of Mechanical Engineers on October 24 compared the overall thermal efficiency of certain representative steam locomotives. In that comparison the Chapelon superheated 4-8-0 compounds were shown to have an efficiency 20 per cent. higher than that of the "Coronation" class Pacifics on the L.M.S.R. The latter engines represent the very highest development so far in this country of the orthodox type of single-expansion superheated locomotive, with piston valves, whereas the rival French machine is a four-cylinder compound having poppet valves for the high pressure cylinders.

The striking difference in overall efficiency can no doubt be traced, not to compounding, but the shape of the indicator diagram. With any form of valve driven by a reciprocating motion throttling occurs, to a greater or less extent, as the valve is closing, and most indicator diagrams show so marked a drop in pressure that it is difficult to recognise the exact point of cut-off. This feature becomes emphasised at high speeds. Churchward's valve setting was one of the best in this respect, though when it comes to a comparison between indicator diagrams taken off G.W.R. locomotives and those from the famous Chapelon rebuilds on the P.O.-Midi the shortcomings

of one of the best piston-valve designs this country has ever possessed are glaringly apparent.

With a well-designed arrangement of poppet valves the cut-off can be made much sharper—indeed approximating to the ideal; and the accompanying sketch shows at a glance the increased area thus obtained on the diagram, by the raising of the expansion line. Furthermore, the point of release and that of compression is, with poppet-valves, independent of the other valve events; compression can be made to start later in the return stroke and thus increase the area of the diagram at the heel. The loss of pressure through throttling at admission is larger than might be imagined; on the P.O.-Midi 4-8-0s, when cutting-off at 52 per cent. in the cylinder and running at 73 m.p.h. it is not more than about 15 to 20 lb. per sq. in. from an initial 285 lb. per sq. in. On the Great Western "Castles" a study of published indicator diagrams shows that at 23 per cent. cut-off there is a drop of about 35 lb. per sq. in. from the pressure at the beginning of the piston stroke when running at 63 m.p.h. On the Midland compounds there is a pressure drop of about 50 lb. per sq. in. between the beginning of the stroke, and cutting off at 67 per cent. at a speed of 68 m.p.h.

In this country we have witnessed some trials of poppet valves, notably on the L.N.E.R. 2-8-2 engine *Cock o' the North*; but the subsequent conversion to piston valves suggest that the experiment was not successful. In view of the great improvement which, on theoretical grounds, is clearly attainable by the use of poppet valves it does seem a pity that more perseverance has not been shown towards elimination of the practical difficulties, which have no doubt led to the abandonment of the few experiments made in this country. That a rich



reward is there to be reaped is shown by the results on the Pennsylvania.

Increased efficiency can be obtained in other directions too; in the design of the steam passages, by the use of multiple-jet blast pipes, by the use of thermic siphons in the firebox. But the cylinders and valve-gear, despite recent improvements, still offer the greatest field.

Yours faithfully,  
O. S. NOCK  
B.Sc., A.M.I.Mech.E.

### Season Tickets by Alternative Routes

44-47, St. Martin's Lane, W.C.2  
November 14

TO THE EDITOR OF THE RAILWAY GAZETTE

SIR,—During the last war, owing to the restricted train services, season and traders' tickets issued by any railway to points served by more than one railway were made available to those points by either route.

In view of the additional restrictions on railway travelling which now seem to be impending, it would be of great benefit to the public if this concession were re-introduced.

Yours faithfully,  
GUY HARRISON

## THE SCRAP HEAP

"People who have never before sat in a third class railway carriage are now doing so daily," asserts a writer. Then they are lucky. Most third class passengers have never had this privilege.—From "Punch."

No. 23, Waterloo Place, Edinburgh, was at one time the Waterloo Hotel, famous for its Grand Hall. It forms one of a block standing alongside the arch commemorating the Battle of Waterloo. The hotel was taken over by the North British Railway in 1899 as its Head Office, and is still the Head Office of the Scottish Area, L.N.E.R.

A soldier who was at Dunkirk has been sentenced by an Aldershot court-martial to one month's imprisonment for fraudulent railway travelling. He said at the trial that he had been recommended for a commission, but this had been cancelled "because of his lapse."

Since 1838, when they were introduced on the Manchester-Leeds Railway, the thickness of train tickets has remained standardised at 1-32nd of an inch. Now, in answer to Lord Beaverbrook's appeal, the L.M.S.R. is reducing the thickness to 1-42nd. Other railways are expected to follow suit. Last year alone the L.M.S.R. printed 250,000,000 tickets.

Stalin's armoured train must acknowledge copyright to Trotsky's armoured train twenty years ago. Trotsky used his armoured train as travelling G.H.Q., as political platform, civil administrative office, radio station, printing press, library, garage for several cars, repair shop, kitchen, dormitory, and bath! Trotsky's train ran for three years and in distance circled the earth five and a half times. It had two engines and was eventually divided into two parts. Thirty picked machine-gunners garrisoned the train, and often had to defend it, for it was a fortress as well. It was bombed, shelled, and twice wrecked.—From the "Evening Standard."

Recent references to the Crimea remind me of a story that was circulating during the Bolshevik invasion of the Crimea. At the time there were units of the British Navy giving the White Russians a helping hand. A White Russian cruiser—so the story runs—had bombarded a coastwise "Red" railway station. Her proud captain wirelessly a British destroyer: "Have fired eight rounds of eight-inch at railway station, obtaining eight direct hits." Next morning came the Britisher's reply: "I notice that the morning train left according to schedule."—From the "Irish Times."

A soldier who accidentally shot himself with his own rifle in a train at a Sheffield station was fined 10s. at Sheffield recently for taking a loaded firearm into a railway carriage. He said that when he picked up his rifle there was a detonation and he found himself shot through the hand. The trigger must have caught in his clothing.—From "The Yorkshire Post."

In the "Appendix to the Fifth Report of the Select Committee on Railways," issued in August, 1840, it appears that the number of trains which arrived within time at the Birmingham terminus of the London & Birmingham Railway, from

November 1, 1839, to March 19, 1840, was 754; the total number of trains run was 781. Of the 27 trains that were over time within that period, 14 were under 30 min., 11 under 60, and 2 under 90. The causes of delay were "trifling derangements of machinery." Of the 781 trains from Birmingham to London, 686 were within time and 95 over time. Of the latter, 74 were worked in connection with the Grand Junction Railway.

The Marlborough Town Council has collected railings for the Ministry of Supply. Marlborough citizens want to know why the Ministry of War Transport puts up new iron railings at a time when everybody has contributed old iron and the council is considering what further railings may be torn down.

### WANTED—A PLAN TO HELP THE RAILWAYS

Day by day the transport burden imposed on the railways of Britain grows. Aid for Russia schemes involving the transport of munitions and raw materials are making it more and more difficult for the railways to maintain that efficiency so vital to the war effort.

Longer hours of darkness intensify the problems. To keep the vast freight traffic moving swiftly and efficiently the railways this winter may have to cut out long-distance passenger trains for a specified period or ration travel in some drastic way.

Perhaps you have an idea or a plan that might help the authorities to solve this pressing problem. If you have, send it to the Editor of *The People*, 92, Long Acre, London, W.C.2. Mark your postcard or envelope "Railways."—From "The People."

The dreadful accident on the Brighton railway on Saturday, whereby the maidservant and footman belonging to one family, the engineer and the stoker, were, as I am informed by an eye-witness, literally smashed to pieces, besides many others dangerously wounded, arose from there being two engines to the train, which ought never, under any circumstances, to be allowed, either both in front or one as a propeller.

... I was a passenger in a train meeting that which had the accident. It will scarcely be credited that our train, and one which arrived afterwards, were joined and about to be despatched with two engines! and would have been so but that a gentleman in the carriage with me fortunately

perceived it and, after remonstrating with the superintendent, who would not alter it, saw one of the directors, who, after our protesting against proceeding with two engines and telling him that he would be considered responsible if any accident occurred in consequence, had the trains divided, with an engine to each.

A coroner's jury, in finding a verdict of "accidental death," had placed a deodand of 1s. on the engines, and had expressed the opinion that the four-wheel type used on the line was not safe.—From "The Times" of October 5, 1841.

Since silk stockings have been rationed the railway company has been losing nearly £1,000 a week through the pilfering of stockings between Watford and St. Albans, it was stated at Watford recently when a shunter-porter at Watford Junction station was accused of stealing silk stockings. Railway police officers visited his house and recovered 22 pairs of silk stockings. He was sentenced to 14 days' imprisonment.

### EXAMINATION

The examiner was questioning the candidate for the position of engine-driver.

"You are driving an engine down a steep incline at an excessive speed. What do you do?"

"Make a brake application," said the candidate.

"Doesn't act," shot back the examiner.

"Put brake handle into emergency position."

"Does not reduce speed sufficiently," went on the examiner.

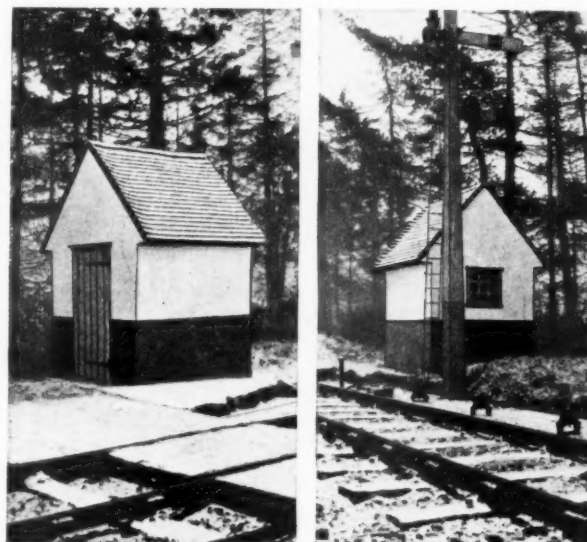
"Reverse the engine and turn on steam," said the candidate.

"The wheels refuse to grip the metals."

"Pour sand on the metals."

"Sand is damp and won't pass through the pipes." The examiner put the question with an air of triumph. "Now what do you do?"

"Let her rip. We've reached the level now."—From the "North-China Daily News."



Two views of an attractive railway lamp room designed by an architect, and showing how utilitarian buildings can be made of pleasant aspect and economical construction

## OVERSEAS RAILWAY AFFAIRS

(From our special correspondents)

### SOUTH AFRICA

#### New Revenue Record

A new revenue record has been created, that for the week ended September 20, 1941, totalling £810,255, of which goods traffic accounted for £532,897, being a new high level and the second occasion on which the £500,000 mark has been passed. The earnings for the week exceed those for the corresponding week in 1940 by £106,000.

#### Staff Representation

A statement has been issued by the administration announcing the new plan of staff representation which has been decided upon. Six main groups of staff have been determined, each consisting of a number of grades between which there is a broad affinity of service interests and working conditions. Each of these six groups will be represented by a staff association, which will be recognised by the administration as the sole negotiating body for the grades within that group.

The six groups are:—Salaried staff; locomotive staff; locomotive shed staff and drivers of mechanically propelled vehicles; traffic employees responsible for shunting operations and trains operations; artisan staff; all other graded staff; rail-workers.

In addition to the six recognised staff associations there will be a consultative committee of all the staff associations consisting of eighteen members, three being nominated by each association. This body will not have executive powers, but will be available to enable staff associations to consult each other on matters affecting the staff as a whole and to enable the administration to obtain through one channel the news of the various staff associations upon matters affecting more than one group of staff.

#### Shipbuilding in the Union

The Board of Trade & Industries has been instructed to carry out an investigation into the practicability of establishing a shipbuilding industry in the Union. The terms of reference to the board are as follow:—

- (1) To receive representations for the establishment of a shipbuilding industry in the Union and to investigate and report upon the practicability of establishing such an industry with particular reference to the following:—
  - (a) The availability of raw materials, principally iron, steel, non-ferrous metals and wood.
  - (b) The shipping market and the ability of a South African industry to compete with shipbuilding yards in other parts of the world, not only during times of prosperity, but also during periods of international trade depression.
  - (c) The possibility of obtaining the necessary skilled and other labour.
  - (d) The possibility of establishing such an industry without assistance, financial or otherwise, from the Government.
  - (e) The disposal of vessels built in the Union.
  - (f) The possible influence that the cost of locally-built ships, if undertaken, may have on the cost of marine transport to and from the Union of South Africa.
  - (g) Any other matter directly or indirectly bearing on the establishment of a local shipbuilding industry.
- (2) To examine any specific scheme submitted to it.

### NEW ZEALAND

#### Extension of Train Control System

The telephonic system of train control which is in general use on the principal lines in the Dominion is steadily being extended to cover all but the less important branch lines. Train operation between Auckland

and Whangarei, is now controlled by this method, although, as an expedient necessitated by delay in delivery of materials from overseas, an ordinary telephone circuit has had to be temporarily impressed for the purpose.

#### Railway Housing

Housing for its employees is a matter that receives much attention from the administration of the Government Railways. In a number of the larger railway centres the Railway Department has erected whole blocks of comfortable, modernly-equipped dwellings for the use of its staff, and at many of the small country stations scattered about the Dominion, railway houses are the only ones to be seen. During recent years, concomitantly with the great growth of its business, the department's staff has increased considerably—including members serving with the armed forces its number now exceeds 26,000—necessitating constant expansion of its housing programme. The current financial year has seen no abatement of this building activity, the intention being to construct 72 houses in the 12 months ending March 31 next. Of these, the bulk will be erected in the North Island, but ten of the South Island quota are to be built at Greymouth, the port for the province of Westland, where there is an acute shortage of housing accommodation. Actually the department is the owner of 4,000 houses, all occupied by members of its staff.

### CEYLON

#### Transport Co-ordination Expert Approved

In presenting the Budget, which this year contains a large deficit, the Home Minister, Sir D. B. Jayatilaka, in the State Council said that a large increase of expenditure was in respect of railway losses. They were aware, he said, of the circumstances in which year after year they had to make good those losses from the general revenue. The Ministry of Communications and Works was doing its best to grapple with that problem, but the results were disappointing. It had, he emphasised, become quite clear that it was impossible to check that ever-growing loss without the co-ordination of road and rail transport. The Board of Ministers had, therefore, approved the decision to engage the services of an experienced officer to undertake that task. If that officer's recommendations were approved, he would be appointed for a period of two or three years so that he might carry out the scheme of co-ordination. Such co-ordination, he added, had been effected elsewhere with great success.

#### Curtailment of Train Services

About 25 per cent. of the mileage of the present service is to be cut down and the speed of the faster long-distance trains is to be reduced by some 5 m.p.h., and the drafting of a new timetable is, consequently, to be taken in hand almost immediately. These measures are now felt to have become imperative as new rails, locomotives and other rolling stock are not now available and the supplies of coal are also irregular. The railway has been able to carry on its service for the last two years almost unaffected by the adverse conditions brought about by the war because of the strict economy that has been exercised, but

it is now considered that it is no longer prudent to continue the service without curtailment and speed restrictions.

This arrangement was necessary because, even after the arrival of one or two cargoes of coal for the railway recently, its stocks were rapidly becoming depleted and the maintenance of the normal train service was difficult. The issue of coal from Colombo to some of the outstations has been temporarily suspended and they have been ordered to draw on reserve stocks. Meanwhile, firewood is being increasingly used as fuel and all old sleepers are to be utilised as fuel, the sale of unserviceable sleepers having been prohibited.

#### Full Wagon Loading

Goods wagons in future are to be fully loaded as far as possible at the despatching stations or the stations *en route* so long as this does not cause abnormal delay to traffic. The loading of wagons with small quantities of goods is to be discontinued unless exceptional circumstances demand it. In this connection fuller use is to be made of the van goods services, particularly in the transport of perishables.

### MEXICO

#### New Construction Financed

The Cia. Mercantile Industrial y Constructora has raised \$10,250,000 for the construction of a 280-mile railway to connect the States of Oaxaca and Chiapas, for which it obtained a Government concession some time ago.

### MANCHUKUO

#### Temporary Curtailment of Traffic

During the latter part of July traffic on the Manchurian railways was seriously curtailed and on some lines all trains were cancelled for a time. Even in the more favoured areas passengers' luggage was severely limited and parcel post services were suspended. No official reason is given for these measures, but it is presumed that they were necessary owing to a large and widespread movement of troops and supplies about that time.

### ROUMANIA

#### A New Danube Road-Rail Bridge

A project is being evolved for the construction of a new road and rail bridge crossing the Lower Danube halfway between the existing Chernavoda railway bridge and Galatz, *i.e.*, between Harsova (Hirsova) on the eastern bank of the Danube and Piuca Petrii on the opposite side. Piuca Petrii is about 13 miles due east of Tandarei, the junction station between the Ploeshti-Slobozia-Tandarei line and the Buzeu-Faurei-Feteshti line, 30 km. (18.6 miles) to the north of Feteshti. Feteshti is the most important station to the west of Chernavoda bridge on the Bucharest-Constanza line. There are two intermediate stations, Ovidiu and Dunarea between Feteshti and the western bank of the Danube, while on the eastern bridgehead is Chernavoda. The latter is 52 miles from Constanza. The Chernavoda-Constanza section is double-track, but to the west of Chernavoda the whole line to Bucharest is single-track, which causes a bottle-neck even now that traffic over this line has been reduced to a considerable extent. The projected bridge between Piuca Petrii and Harsova is intended to improve the flow of both railway and road motor traffic between Constanza and the Dobrudja on the one hand, and that part of Roumania lying west of the Danube, on the other.



## SIGNALLING DEVELOPMENTS ON THE G.I.P.R.

*Abridgment of paper presented to the Institution of Railway Signal Engineers and circulated for written discussion*

*By H. E. COX, Deputy Chief Engineer, Signals, G.I.P.R.*

**I**NTERLOCKING of crossing stations on the Great Indian Peninsula Railway began in 1878, but was not continued until many years later, when it was the subject of much discussion and delay. A typical crossing station on the G.I.P.R. fitted with the original interlocking is shown in Fig. 1; in some cases, however, the siding is the second line. The two cabins are worked by illiterate levermen of the points-men class, the block instruments being in the stationmaster's office. The stationmaster, in addition to having control of the block working, is also given control of the levers in the cabins working the arrival and departure signals. This was originally done by means of an interlocked key box and, for some years after the stations were first opened, the keys were sent out by hand. Increasing traffic, however, made it necessary to adopt quicker methods. Electric key trans-

mitters were therefore added to the original equipment. At stations equipped later, direct release of the key transmitter in the cabin is given from an electric slide instrument, with interlocked slides, in the stationmaster's office. Other Indian railways have made considerable use of electric slotting for these stationmaster's controls, which some consider to be a better method. A full equipment of starters and advanced starters is provided. The advanced starter is fixed 600 ft. beyond the outermost points, with at least a quarter of a mile between that signal and the outer and warning. Under such conditions the Indian General Rules permit shunting up to the advanced starter in the face of an approaching train, and use is made of this facility by the G.I.P.R. Token inter-

already obtained the equipment, and it would have involved considerable expense to alter the arrangements. They are, however, bad from an operating point of view if the loop has to be used for crossing passenger trains, owing to the existence of derailing switches immediately in front of the siding dwarf starters. Extensive use was made at the original stations of switch and lock movements (otherwise known as economical facing point locks) to cheapen the cost of installation. They were originally all of the well-known Black's type, but many have since been renewed with the American type of movement with much improved results. The latter type is now standard.

### Later Developments in Single Line Interlocking

Later developments of the crossing stations are shown in

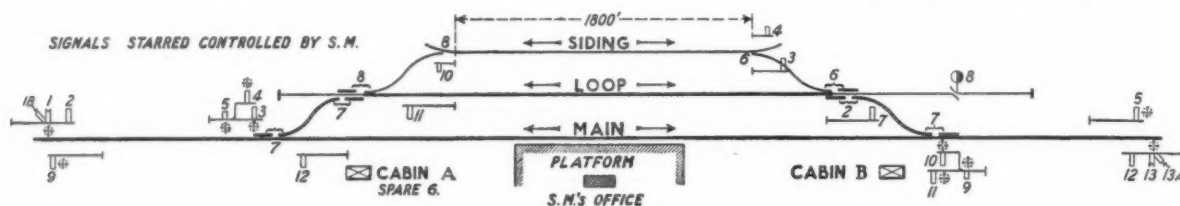


Fig. 1

mitters were therefore added to the original equipment. At stations equipped later, direct release of the key transmitter in the cabin is given from an electric slide instrument, with interlocked slides, in the stationmaster's office. Other Indian railways have made considerable use of electric slotting for these stationmaster's controls, which some consider to be a better method. A full equipment of starters and advanced starters is provided. The advanced starter is fixed 600 ft. beyond the outermost points, with at least a quarter of a mile between that signal and the outer and warning. Under such conditions the Indian General Rules permit shunting up to the advanced starter in the face of an approaching train, and use is made of this facility by the G.I.P.R. Token inter-

Fig. 2 and 3, the latter having the great advantage of permitting two trains to be received at the same time, but Fig. 2 represents the great majority of stations as they are now. In both cases all three lines are properly equipped and signalled for crossing passenger trains and much use has been made of independent facing point locks on the main line. The requirement that both passenger running loops and sidings must be isolated from the main line to obtain permission for unrestricted speed for through running has been enforced rigidly for many years. It is open to doubt whether Indian railways have had any appreciable return on the large sums they have had to invest in sand hump traps and additional interlocking equipment. A period of 27 years has passed since the last of the

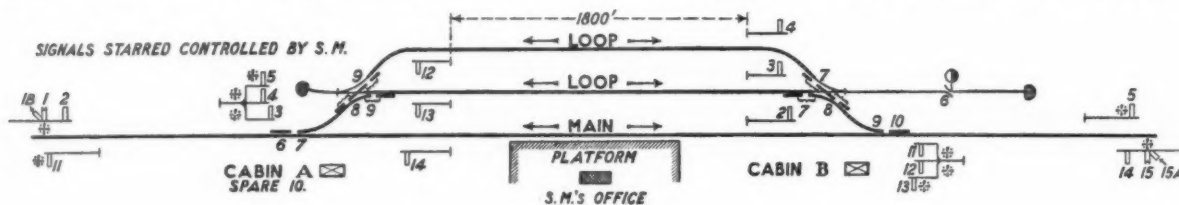


Fig. 2

locking has been adopted only to a limited extent in spite of the general use of advanced starters. The question of starting signals is one of the several "hardy annuals" of Indian signalling.

Although the third line—or in some cases the second line—is called a siding, it is equipped for the reception and dispatch of trains. The method by which this was originally done, by small shunt arms and dwarf signals, came in for considerable criticism. It was argued that the third—or second—line should either be treated as a stabling siding only or, if signalled, dealt with on exactly the same basis as the other two lines. The compromise of treating it as a goods loop was eventually accepted, mainly because the company had

original set of G.I.P.R. crossing stations was completed. Operating costs have changed considerably during the interval—in an upward direction. Although still low, compared with costs in some other countries, they are not low when judged by Indian standards. It is more than ever necessary to keep them down by central cabin schemes, wherein the largest area is operated in the shortest time by the smallest number of men.

These sound economic principles have been applied, by means of double-wire equipment, to crossing stations on the South African Railways for many years and, although suggested by Mr. Stokes for the G.I.P.R. in 1905, were not actually applied in India until the Assam-Bengal Railway

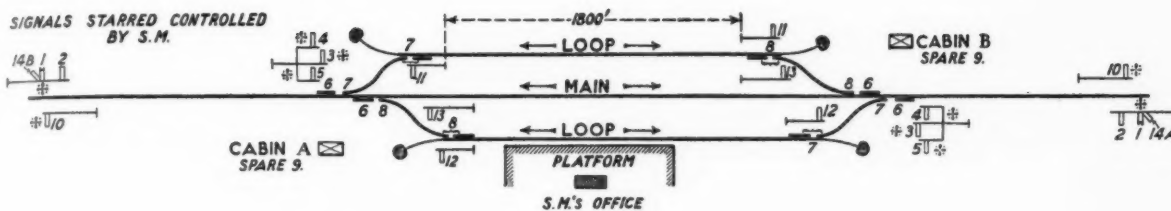


Fig. 3

carried them out at five stations in 1929. As a 3-aspect signal becomes a practical possibility with double-wire working, that line has applied the principles of American speed signalling to Indian requirements (Fig. 4). There is one 3-aspect home signal in each direction. When the loop line is occupied, the speed of a train running through must be restricted to 30 m.p.h. and the driver is reminded of this by receiving the aspects green, yellow, green instead of the aspects green, green, green (Fig. 4). There is not much doubt that double-wire equipment will be used in future, both for new interlocking and renewals of old interlocking, at Indian crossing stations.

The continuously manned crossing station presents the problem that, although from the transportation point of view it may be necessary to divide an unduly long section and provide crossing facilities, it may be quite unnecessary commercially. This problem became acute when the economic depression reached India in 1931; a number of unremunerative crossing stations on the G.I.P. were temporarily closed and have since either been closed permanently or converted into "flag stations" without signals (*i.e.* halts).

#### Growth of Interlocking Generally

Interlocking crossing stations for unrestricted speed at the

saved. All the cabins on the quadrupling and at large stations elsewhere are block cabins, the stationmasters having nothing to do with block working.

In 1925, to the regret of many, the G.I.P.R. became part of the Indian State Railways. The single line section from Jubbulpore to Allahabad, a length of 223 miles, was taken over from the East Indian Railway, and included 30 crossing stations (since reduced to 23) equipped with the Dutton system of interlocking, rejected 22 years before for the company's original single line interlocking! The growth of signalling appears from the following figures:—

Year	Cabins	Working levers
1911-12	—	5,505
1919-20	—	11,223
1924-25	646	12,146
1930-31	685	13,773
1938-39	605	12,656

The present position is that of the total 5 ft. 6 in. gauge route-mileage of 3,440 miles, 2,257 route-miles, or 65½ per cent., are interlocked; comprising all the main routes from Bombay to various parts of India over which express trains run (Fig. 5). The balance is made up of branch lines, where, with one or two exceptions, traffic is light and there are no express

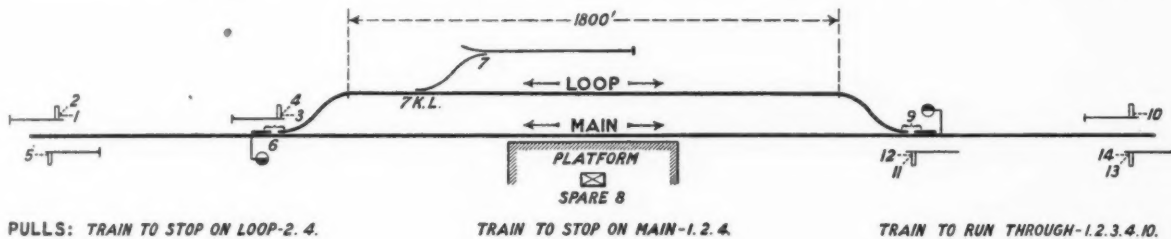


Fig. 4

lowest annual cost has formed—and will always continue to form—the major task confronting the signal engineer in India. Works of a type more familiar to British signal engineers were the doubling from Khandwa to Itarsi, a distance of 110 miles on the main line from Bombay to Delhi, with 24 stations; and that from Lonavla to Poona, a distance of 40 miles on the main line from Bombay to Madras with 6 stations carried out in 1907. Both had to be dealt with during the same period as the construction of the single line interlocking.

From 1915 to 1918 the doubling from Shegaon to Nagpur, 180 miles, on one of the two main routes from Bombay to Calcutta, with 26 roadside stations, was done in addition to three large stations and goods yards at Badnera Wardha, and Nagpur on entirely different sites from the old stations; at Nagpur there is now a very fine station with five through platforms controlled from four cabins, one of which contains 100 levers. Probably the largest and most important work was the new signalling for the quadrupling of the main line from Byculla (a suburb of Bombay) to Kalyan, a distance of 30½ miles. Separate signal cabins were used for each pair of lines, where there were no junctions between the four tracks, under the instructions of Major H. A. L. Hepper, R.E., who succeeded Mr. Rickards as General Manager. Such an arrangement was, of course, expensive, not only in installation cost, but in operating costs, which gradually rose as the years passed. During the last few years all those unnecessary cabins have been removed, operation being concentrated in fewer and larger cabins, and large sums have been

services. Such lines are still not provided with interlocking and are not likely to be. Under the flexible General Rules their crossing stations are provided with outers and homes only in both directions, or, on lines of lighter traffic, with outers only. A few small branches are worked without signals on the "one engine only" system. There seems little prospect of much new construction, except for the replacement of worn-out equipment and further cabin concentrations to save operating expenses.

#### Maintenance Organisation and Reporting of Failures

The G.I.P.R. has four Divisional Signal Assistants, at Bombay, Igatpuri, Jhansi and Jubbulpore, reporting direct to the Signal Engineer in Bombay; their divisions are subdivided into 15 inspectors' sections. The number of lever units per division varies from 2,982 to 3,380. The Jhansi Division covers a length of 940 route-miles and the Jubbulpore Division 1,039 route-miles. The number of lever units on an inspector's section varies from 424 to 1,209, the smallest being on certain single line sections where it is difficult for an inspector to travel about and the length of a day's (manual push) trolleying is limited. On the large sections there are one or more assistant inspectors and the divisional assistant engineers have motor trolleys.

Prior to 1928 the G.I.P.R. had no system of reporting signal failures. Since 1931 signal inspectors have had to send in a report of every failure, whether delays have occurred or not, to the Divisional Assistant Signal Engineer, as soon as possible

after the failure has been rectified. The traffic controllers also have to send in to the divisional assistants a daily record of the failures reported to them by stations or cabins. A graphical record is kept, both in the offices of every divisional assistant and of the Signal Engineer, showing the failures reported on every inspector's section every month. Every divisional assistant also has to send in to the Signal Engineer a monthly summary showing the causes of all the failures that have occurred on the inspectors' sections on his division during the previous month, all sections on a division being treated as one for this summary. The main difficulty that arises in India in carrying out these ideas is obtaining truthful and

tions on other railways, 3-aspect signals have been adopted from the beginning.

In accordance with the 1929 General Rules, purple marker lights were originally provided, illuminated by means of 110-volt, 15-watt commercial lighting lamps. It was soon found that these lights gave little or no indication in the daytime, but that a motorman, seeing the marker light unit, got to know that the signal was an automatic. Difficulties arose later, however, when "A" lamps came to be provided on a number of semi-automatic signals which, for part of the day, might be working as automatics. There were cases of motormen mistaking a non-illuminated "A" lamp for the ordinary marker light unit and passing the signal under the stop-and-proceed rule. The next step, therefore, was to provide transformers and "focus" lamps for all marker lights and "A" lamps, which effected a great improvement in the daylight indications. If a marker light failed, however, when an automatic signal was at danger the signal became a stop-and-stay and there might be considerable delays. After various experiments "A" marker signs were eventually adopted in 1936, consisting of a disc on the signal post, 15 in. in diameter, showing a black "A" on a white ground; the train or engine headlights show the markers up well at night. Thus the principle used in distinguishing an automatic signal, either whole time or part time, is always the same—an "A" marker.

### Signalling Cables

In the light signalling works, as originally installed, all cables were "-ite" insulated and wire armoured, laid direct in the ground, about 4 ft. below rail level on a thick bed of sifted soil, covered by a layer of it at least 6 in. deep. Faults began to develop after about 12 months, mostly at "corners" in the runs where the cables had been diverted to apparatus cases. There was every reason to believe that they were due to electrolytic action, set up by stray traction current in the ground. They were rectified and steps taken to prevent recurrence. Some time later, further faults of a different kind occurred. In all these cases the wire armouring was found intact, but the "-ite" insulation was burnt to ash for about an inch; in some instances, the conductor also was burnt through. On both sides of the fault the conductor and insulation were in perfect condition. Soon another type of fault developed, in which the wire armouring was again intact, but the insulation, instead of being burnt, was found sodden with moisture. The sodden length might be as much as 12 ft. long, but on both sides the insulation would be found quite dry and in excellent condition.

By then the G.I.P.R. had come to the conclusion that the insulating material was porous, or became so after being buried for some time, and considered that "-ite" cables would not be satisfactory in the ground unless protected against moisture with a lead sheath. The moisture trouble was thought to be aggravated by the presence of the jute filler, as it acted as a wick throughout the cable. The manufacturers, however, held that moisture was not necessarily the cause of the trouble and that the faults were due to electrolytic action and the presence of harmful chemicals in the sub-soil. It was difficult to accept their electrolysis argument for those faults where the armouring was intact and showed no signs of corrosion. A considerable number of important and lengthy runs of signalling cable were then found to have deteriorated so seriously as to require renewal as soon as possible if a breakdown of the signalling system was to be avoided. These renewals were made with "-ite" cable, "-ite" filled, lead sheathed and wire armoured, laid in concrete trunking above ground.

A discussion in 1932 brought out that all "-ite" cables had been found unsuitable for laying direct in the ground, and in some cases had failed entirely, as on the G.I.P.R., within 12 months of being laid. Experience had further shown that the "-ite" insulation was definitely hygroscopic, but that it was possible partly to restore the insulation resistance of cables, by lifting them above ground and allowing them to dry out. It was generally agreed that the only suitable type of cable for laying direct in the ground was the lead covered and armoured with rubber or impregnated paper insulation, provided with suitable sealing-ends. It was therefore decided to attempt to save the remainder of the G.I.P.R. buried signalling cables by lifting them out of the

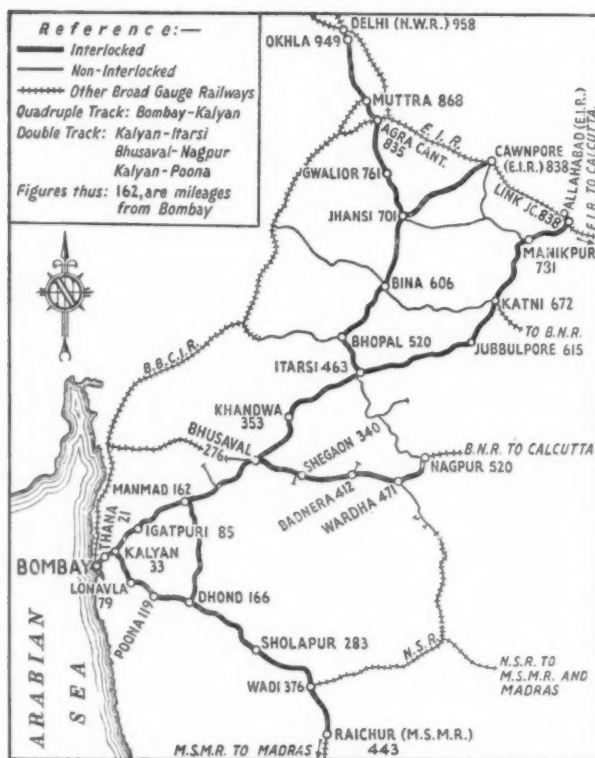


Fig. 5

accurate information. The first thing that seems to occur to a maintainer is how he can pass the responsibility for a failure, especially if it involves a train delay, on to someone else, and this attitude applies just as much to the cabin staff as to the signal maintenance staff.

### Light Signals

The G.I.P.R. was the first Indian railway to try light signals and bring a complete installation into service. A position-light and a colour-light signal were tried in 1920 and 1923 but their daylight range was found insufficient. About a year later, however, a successful trial with a "searchlight" type signal had the valuable result of demonstrating the possibility of using colour-light signals instead of electric semaphores for the projected Harbour Branch automatic installation, approved by the Railway Board in 1923. A definite decision in favour of colour-lights was made in 1924. The signals were to be of the 2-unit, 2-aspect (or stop and repeater type), the use of 3-aspect signals not then being permitted.

In 1929, a revised edition of the General Rules was officially issued. The most important signalling alteration from the 1906 edition was the inclusion of rules covering 3-aspect semaphore and colour-light signals. This development has now been adopted, all signals being changed over from 2-aspect to 3-aspect in 1934. In the later colour-light installa-



ground and placing them on cable stakes, or brackets on boundary walls and fences, or in raised concrete trunking, the worst sections being taken in hand first. This policy undoubtedly saved the cables.

No signalling cables are now buried unless the practice is unavoidable. Those crossing tracks are laid in concrete trunking at ground level where bridges, gantries, etc., do not exist or if the number of cables does not justify a special gantry. "Tails" from main runs to operated units are kept as short as possible by providing a disconnecting box near every unit. These "tails" are unarmoured wires in galvanised steel pipes and can easily be got at for testing and renewal. Main cable runs are now 660-volt grade, "special rubber" insulated and filled, single wire armoured and served overall, and run above ground, generally on cable stakes. Cabin relays and wiring were formerly enclosed in steel casing or wood trunking. Such casing or trunking was, however, much appreciated by rat colonies which did considerable damage to the wire insulation. There was also fire risk with the wood trunking. Relays are now therefore housed on open type steel racks with all the wiring exposed and carried in aluminium rings. These arrangements, besides being inexpensive, are found not to obstruct the rats and consequently wires are not attacked; wires are also easily accessible for inspection and test. Wire with flame-proof braiding is now used for renewals.

### Signalling for High Speeds

The maximum speed on the broad (5-ft. 6-in.) gauge lines is generally 60 m.p.h., or even less, and there are very few exceptions. One is the electrified area of the G.I.P.R. from Bombay to Igatpuri and Poona, a distance of 171 route-miles, where the maximum speed of passenger trains hauled by electric locomotives is 65 m.p.h. At the majority of stations in India, "B" class working\* is used, the main exceptions being the main lines of the East Indian Railway between Calcutta and Allahabad, including the Grand Chord, and the 4-track main line of the G.I.P.R. between Byculla and Kalyan, a distance of 30½ route-miles. In the remaining portion of the G.I.P.R. electrified area (excluding the colour-light section) "B" class working was used until quite recently, but the question arose whether drivers had adequate sighting distance of the first signal at each station, the outer, for the speed of 65 m.p.h. Service tests were therefore made to determine what braking distances were actually required by the electric passenger trains moving at the highest speeds permitted, an average of the results being as follows:—

Speed, m.p.h.	Actual distance (ft.)	Distance + 10 per cent. margin (ft.)
50	1,630	1,790
55	1,850	2,030
60	2,100	2,310
65	2,390	2,630

Owing to the grades and curves on the two remaining sections in question (Kalyan-Igatpuri, and Kalyan-Poona), many outer signals had unsatisfactory sighting distances. It was therefore decided to convert the stations there from "B" to "A" class to increase the safety of working. This slightly reduced the capacity of the sections but not enough to matter from an operating point of view. Such problems with the outer and warner signal do not often arise, India being an open country where long signal sighting distances are usual. In fact that signal has given excellent service on all railways for about 35 years, at speeds up to 55 and 60 m.p.h.

### Yellow Arms for Warners

In "A" class working on the G.I.P.R. the usual Indian arrangement of distinguishing a warner on a separate post by a green marker light above is not now employed; the 1929 General Rules permitted the use of the modern distant (warner) signal with a yellow arm and light. This is a considerable improvement over the old arrangement because:—

(a) it involves the maintenance of only one light instead of two, and

\* At a "B" class station the warner (equivalent to the British distant signal) has a stop signal, called the outer, mounted over it. At an "A" class station there is no outer, the warner standing alone.—Ed. R.G.

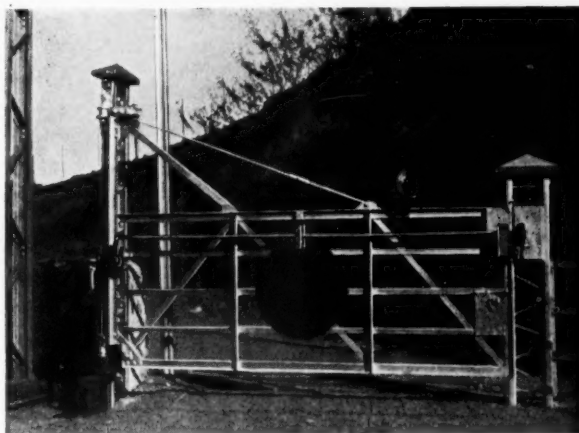
(b) it obviates the display of a misleading green light in the event of the failure of the lower red light.

The old green-over-red aspect has the further disadvantage in having different indications in "A" and "B" class working. In "A" class working, it means "proceed; be prepared to stop at next signal," whereas in "B" class working, with the usual arrangement of the outer being released by the home, it means something like "proceed; pass next signal at restricted speed."

The first use of warners with yellow arms and lights was made throughout the Bombay suburban area in 1933 and proved entirely satisfactory. The warner signals are ordinarily located at not less than full braking distance from the home signals for 65 m.p.h. The yellow arm and light is not used, however, in cases where the warner is a lower arm on the post of a stop signal. The red-over-yellow aspect has not been used on the G.I.P.R., nor probably on any other Indian railway, even though such an aspect was permitted in the 1929 General Rules. Permission to use it in India is shortly to be withdrawn. The G.I.P.R. has not yet found the double-yellow fourth aspect necessary in colour-light territory.

### Standardisation of Signalling Equipment

The first real step towards the standardisation of Indian signalling equipment was taken by Mr. S. T. Dutton, when Signal Engineer of the East Indian Railway, in sending a note to the Indian Railway Conference Association in 1919, suggesting such action. In 1920, the association passed



Steel level crossing gate with gate locking

a resolution appointing a sub-committee "to consider the possibility" of standardising signalling fittings generally. The first meeting of this sub-committee was held in 1921 and a report issued in due course containing detailed proposals for a number of standard fittings. These were duly accepted by the Indian Railway Conference Association in 1922, a book of drawings being issued as standards in 1923.

The association also agreed that the sub-committee should be made permanent and hold annual meetings, at which a number of new or revised standards were afterwards added to the book. In 1926 this sub-committee was dissolved, as the Railway Board decided to take over all signalling standardisation and form another standing committee to advise it on standards, to be known as the Signalling and Interlocking Standards Committee. This new committee held its first meeting in that year. One of its tasks was to examine in detail all the existing I.R.C.A. signalling drawings, in the light of the service experience gained, and proceed with further standardisation. The committee was afterwards called together at irregular intervals but from 1932 has met annually.

On the G.I.P.R. itself a small start had been made on the work of preparing suitable standards about 1917; the task was not tackled thoroughly, however, until 1922, after the

early meetings of the original standardisation committee appointed by the I.R.C.A. Few of the standards subsequently adopted were entirely new designs; they were mostly adaptations, either wholly or in part, from the practice of the leading British railways and of the Signal Section of the Association of American Railroads. In a number of cases the co-operation of the signal manufacturers was sought and valuable assistance obtained. All G.I.P.R. standards are subject to review in the light of service experience and development in manufacturing methods. By the end of 1935, the work begun in 1922 was practically completed. The G.I.P.R. standard type of signal post used for a number of years is tubular. The American practice of clamping the fittings directly on the post without any through bolts has proved quite satisfactory.

In the United States, and in those Continental countries where point rodding is still used, it is the practice to give it a longer initial stroke than is general in Great Britain, to make up for the inevitable loss of stroke in the run and minimise the risk of levers being forced over against obstructions. A longer initial stroke also makes increased working distances possible, there being cases on the G.I.P.R. of points working up to 1,300 ft. from the lever. An 8-in. stroke was introduced there in 1925 and is now recommended practice for India. The G.I.P.R. has used most types of point rodding in the course of time, except the galvanised channel pattern now general in Great Britain, it being a special section difficult and expensive to obtain in India. The present standard is galvanised tubular with coupling ends—the type of end originally known as the Blackall joint—with the rollers also galvanised.

#### Signal Wire Breakages

Up to 1927 the G.I.P.R. had always used No. 7/17 strand signal wire, but in that year, to reduce costs, a changeover was made to No. 10 S.W.G. solid, already employed for years on several other Indian railways. It took some time before this change made itself felt in the failure returns, but eventually it became clear that the money saved in first cost was being spent in repairing or renewing broken wires. Attempts of many kinds, such as improved installation and jointing methods, were tried to check the rising tide of breakages, but without any appreciable result. The following conclusions were arrived at:—

(a) To obtain an adequate margin of strength over the "snatching" and other strains which may be put on the wire by the leverman with a severe obstruction in the run, it is necessary to use wire of high tensile, i.e., at least 80 to 90 tons per sq. in.

(b) Such a high carbon steel wire, however, exhibits a tendency to brittleness and has a lack of uniformity; it is also very difficult to handle and make off satisfactorily into joints.

(c) With strand wire an adequate margin of strength can be obtained, without having to use wire of too high a tensile; it is flexible, easy to handle and make off into joints; the usual wrapped joint develops the full strength of the wire; warning of impending breakage is generally given by one or two strands going first.

From 1937 it was decided to revert to No. 7/17 strand and use a wire of 60-70 tons tensile, in accordance with British Standard Specification No. 163. The results appear to be satisfactory but it is yet too early to say definitely whether the serious problem of broken signal wires has been solved. If the results finally prove not to be satisfactory, then the question of using 70 to 80 tons tensile, or even 80 to 90 tons, will arise.

#### Instructions to the Staff

As the volume of original construction work slowed down there was time to reconsider the rules and instructions which had been issued from time to time to the outdoor staff, to guide them in construction and maintenance. The first attempt to "codify" such rules and instructions in handy form was made by the issue of a small instruction booklet about 1914. Useful though it was, it did not go very far. A great deal was still left to the knowledge and experience of the inspector. The result was that construction and maintenance practice varied quite considerably on different sections of the G.I.P.R. for no real reason. Then the original inspectors brought out from England were beginning to retire and a number of Indian and Anglo-Indian inspectors and assistant inspectors were coming on who wanted to learn. The need was therefore felt for fuller and more detailed instructions,

especially as there were—and are—no other sources in India to provide such information. It also has to be remembered that the average subordinate official would much rather be guided by detailed rules or instructions than think out his details for himself. Left to his own resources he seldom seems able to plan out his work methodically and economically; he merely muddles along. Therefore in 1919 the original little booklet was much enlarged and rewritten as the first edition of the "G.I.P. Interlocking Handbook," a real attempt to standardise practice in construction and maintenance throughout the line and help the staff in their work generally. It was the work of several hands, senior inspectors as well as head office staff.

In 1927 it was necessary to issue a revised edition, which was used by the Signalling and Interlocking Standards Committee as the foundation for its work in preparing the Railway Board's "Signalling Manual." By 1937 another revised edition was found to be required and the opportunity was taken to revise and enlarge the handbook completely throughout. As a further means of spreading technical knowledge and assisting the staff in solving their problems and difficulties, it was decided to hold periodical meetings of the divisional assistants. They are held at some central point, to reduce travelling time, the chair being taken by one of the assistants themselves, in order to encourage an informal and full discussion of the agenda; an abstract of the proceedings is afterwards forwarded to the head office. All divisional assistants now hold quarterly meetings of their inspectors. Any proposals or recommendations considered of sufficient importance are sent on to the head office for disposal.

#### Commercial Aviation in Argentina

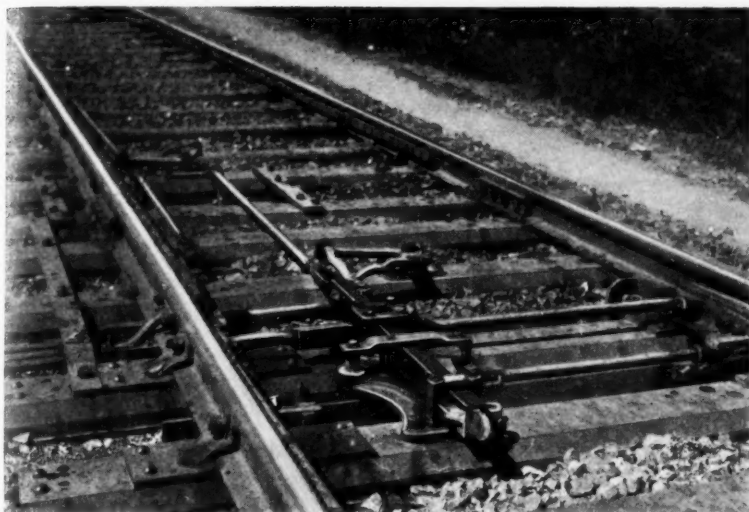
Civil aviation activities in Argentina for 1940 showed an increase over previous years. Comparisons for the past three years are as follow:—

Item	1938	1939	1940
Kilometres flown	1,588,243	1,604,276	1,556,772
Hours flown	6,565	7,250	6,351
Number of trips	2,225	3,977	4,288
Number of passengers	21,519	35,950	40,690
Mail, kilograms	77,767	75,314	77,059
Express, kilograms	41,899	37,977	62,272

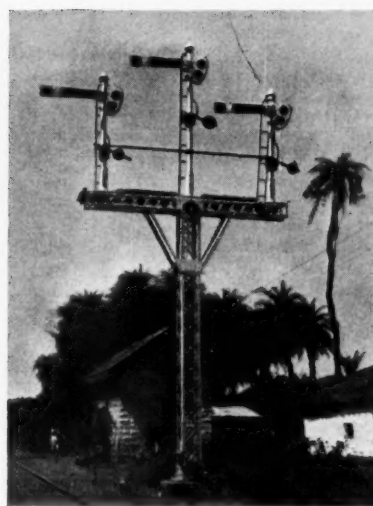
The activity for each of the commercial air lines operating in Argentina during 1940 is indicated in the following table:—

Airline	Km. flown	Hours flown	Trips made	Passengers	Mail kg.	Express kg.
Aeroposta Argentina	427,480	1,791	233	3,357	10,529	9,498
Pan American-Grace	695,647	2,541	499	6,533	17,077	24,388
Pan American Airways	91,365	464	267	2,807	18,958	12,042
Sindicato Condor	102,646	338	245	2,590	16,801	12,440
Air France	63,699	285	102	495	10,952	1,558
Corporacion Sudamericana de Serv. Aereos	69,200	341	692	6,514	1,230	1,032
S.A.N.A.	16,311	108	660	4,229	—	—
C.A.U.S.A.	66,900	329	669	6,952	511	1,315
Expreso de La Plata	23,524	154	921	7,213	—	—
Total	1,556,772	6,351	4,288	40,690	77,059	62,272

Although some of the above services are international, the number of kilometres represents only the distance flown over Argentine territory. Aeroposta Argentina is a domestic company, operating between Buenos Aires and Tierra del Fuego. Pan American-Grace statistics include the services from Buenos Aires to both Chile and Bolivia, while Pan American figures represent the services from Buenos Aires to both Paraguay and Brazil. Condor and Air France figures include their respective lines from Buenos Aires to both Chile and Brazil; Air France services were suspended during the latter half of the year. The Corporacion Sudamericana de Servicios Aereos (Argentina) and C.A.U.S.A. (Uruguayan) operate between Buenos Aires and Montevideo, while S.A.N.A. (Argentine) and Expreso de La Plata (Uruguayan) connect Buenos Aires and Colonia. The above table does not include operations of the Argentine Army air line between Buenos Aires and the south-western part of the Republic.



*Switch and lock layout on steel sleepers*



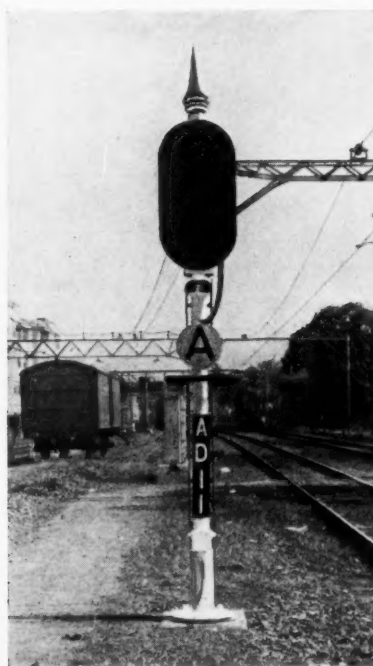
*Bracket-type signal post with three dolls*



*Unit detector layout*



*Facing-point lock layout*



*Automatic colour-light signal with "A" marker sign*

# **SIGNALLING DEVELOPMENTS ON THE G.I.P.R.**

*(See article on pages 524-528)*

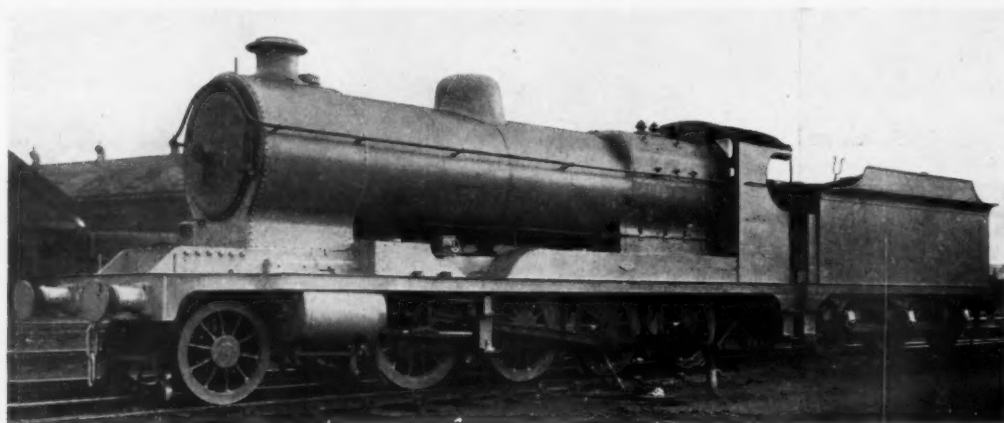


## OPEN GOODS WAGONS FOR THE MIDDLE EAST

*In ten weeks the Southern Railway has built 1,000 steel-frame open 12-ton wagons for service in Persia to transport supplies to Russia*

THE British railways have recently supplied a considerable amount of rolling stock for service overseas to transport material aid to Russia. Fifty L.M.S.R. and 92 L.N.E.R. 2-8-0 freight locomotives have been equipped, and together with tenders and spare parts either have been or are being despatched; some are already in service. The locomotives provided by the L.M.S.R. are of the standard "8F" 2-8-0 type, and before being sent overseas are converted from coal to oil burning. A description of these standard Ministry of Supply locomotives, which have been converted to burn oil, for use in the Middle East, was given

been constructed is evident from the fact that it was at a meeting as lately as September 5 that Mr. O. V. Bullock, Chief Mechanical Engineer, agreed that the Southern Railway Company should undertake the construction of 1,000 wagons for overseas, subject to assistance from the other railway companies in the supply of certain materials. It was stated at that meeting that the first shipment should be made about October 4, and that the wagons should be made ready at the rate of about 100 a week. On September 6 a Works Managers' meeting was held to discuss the allocation of work and details to be supplied by other companies. The



*One of the 92 L.N.E.R. 2-8-0 locomotives of the R.O.D. type used in the last war ready for sending overseas*

in THE RAILWAY GAZETTE of November 7 (page 469). The L.N.E.R. locomotives are of former Great Central Railway design which were the standard R.O.D. design for overseas use in the last war.

As was briefly recorded in THE RAILWAY GAZETTE last week at page 512, Colonel J. J. Llewellyn, Joint Parliamentary Secretary to the Ministry of War Transport, on November 10, sent on its way, for use in transporting aid to Russia, the last consignment of the 1,000 open 12-ton wagons which have been built by the Southern Railway Company in two of its shops. The speed with which these wagons have

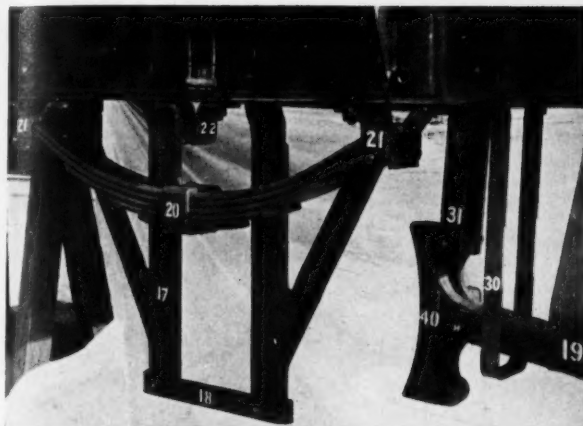
L.N.E.R. assisted by cutting wagon timbers from logs, and supplying certain ironwork details for the wagons, and the L.M.S.R. by providing stampings of standard wagon parts and by supplying considerable quantities of timber. It was agreed that 820 steel underframes should be built at one S.R. works and 180 underframes at another. Two days later the Chief Mechanical Engineers of the companies met to agree to the allocation of details to be supplied by the other companies, and next day instructions were issued to the works. On September 20, well ahead of schedule, the first shipment was made of 50 wagons, and, as has previously



*An assembled wagon with all parts numbered to facilitate re-erection after it has been dismantled and packed*

been stated, the last shipment was made on November 10. The first underframe was completed on September 9.

The employees in the wagon underframe shop at the larger of the works during the production of the wagons broke all their previous records by maintaining an average rate of output of one wagon for every 37 minutes working time for a period of 8 weeks. In this shop, in which numbers of women are now employed, the employees, during the visit of Colonel Llewellyn, assembled, riveted, and completed a wagon in a little over 20 minutes. There are 1,792 parts in each wagon and each part was numbered for ease of reassembly; they were packed, complete with spares, in



*Pedestals, spring, and brake gear showing detail of numbering*

crates, as shown in one of the accompanying illustrations, and in all 130 men, 19 boys, and 22 women were employed with an average of 67 hours per week per person in building the wagons. During the course of construction there were no fewer than 76 air raid warnings during a period in which London had but one alert.

After Colonel Llewellyn had sent the last wagon on its way towards its overseas destination, he inspected the works. He was accompanied by Colonel Sir Alan Mount, Chief Inspecting Officer of Railways, and the following representatives of the Southern Railway Company: Colonel Eric Gore-Browne (Deputy Chairman), Mr. E. J. Missenden (General Manager), Mr. J. Elliot (Deputy General Manager), Mr. G. Ellson (Chief Engineer), Mr. R. M. T. Richards (Traffic Manager), Mr. H. E. O. Wheeler (Superintendent of Operation), and Mr. C. Grasemann (Public Relations & Advertising Officer). After leaving the works Colonel Llewellyn sent the following message to the employees:—

"It has really been a great pleasure to me to visit the



*Wagons packed in crates on their way to the Middle East*

works and to see for myself the good work being done by all there. You who are doing that work are geographically almost in our front line; you are certainly in the front line of our industrial war effort. The job of constructing new and repairing old rolling stock is just as important to the country at this time as is that of making aeroplanes or tanks. Without good communications our factories would cease for lack of materials, and our Navy, Army, and Air Force could not get the supplies which they need. Go full speed ahead therefore with your good work, and good luck to you all."

### Paris Transport Unification

A law passed on September 20, 1940, to which we made brief reference at page 442 of our October 25, 1940, issue, provides for the amalgamation of all the urban public transport systems of Paris into one organisation generally similar to the London Passenger Transport Board. Thus the Compagnie du Chemin de Fer Métropolitain de Paris will in due course become merged with the Société des Transports en Commun de la Région Parisienne to form the new body. The Conseil des Transports Parisiens is charged with the responsibility of studying all aspects of the situation, but apparently there is no intention of hurrying the unification. Meanwhile, some steps have been taken towards the ultimate objective, and, on August 4 last, return tickets were abolished on the Metro system, and were replaced by workmen's weekly seasons costing fr. 10. At the same time first class fares were abolished from the Paris buses and, instead, weekly tickets are being issued to suburban residents

entitling them to use the Metro, the bus services, and the suburban services of the main-line railways (including the Grande Ceinture) without discrimination. It is understood that first class carriages are being retained on the Metro and it was reported from America, at the beginning of the present year, that the German Occupation Forces had introduced a rule reserving these first class carriages solely for the German troops and making the French travellers use only the second class carriages; there is no third class on the Paris Metro. Precise information is lacking as to whether the whole of the Metro system is at present working; as long ago as February 22 last a German official announcement stated that some 157 km. (about 98 miles) were at work, and that time 36 stations were closed, however. The Paris Metro system comprises 178 km. (111 miles), including the Sceaux line. Last Sunday it was announced that 25 Metro stations were to be closed in view of fuel shortage, lighting reduced to the minimum, and lifts and escalators stopped.

## CABLE HAULAGE ON MAIN LINES

*Some notes on the rope-operated inclines at Liverpool, Camden (London), Cowlairs, and Erkrath*

**A**LTHOUGH the operation of railways by cables hauled by stationary engine is a practice of considerable antiquity, and is still used extensively in many parts of the world on steeply-graded mineral lines, examples of such working of sections of main-line railway are comparatively scarce. In England the outstanding examples are the termini of the original main line between London and Liverpool, and in Scotland the Glasgow terminus of the old Edinburgh & Glasgow Railway (now L.N.E.R.).

### Stationary Engine Working in Liverpool

When the main line was completed between London and Liverpool, in 1838, locomotives did not reach either terminus. In the London area cable traction was used between Camden and Euston, and at the Liverpool end for the lines west of Edge Hill. The first passenger station in Liverpool was at Crown Street and was approached from Edge Hill through a single line tunnel 290 yd. in length, 15 ft. wide, and 12 ft. high, which was built in 1829. Trains approaching Crown Street were drawn up the rising incline from Edge Hill by a rope and stationary engine, and outward passenger trains were lowered from Crown Street to Edge Hill where locomotives were attached. This station was already out of use, however, by the time the railway was completed to London, for traffic outgrew the accommodation and the situation was found to be too far from the business centre of the town. Hence a tunnel was cut from Edge Hill to Lime Street, 2,230 yd. long, 25 ft. high, and 17 ft. broad, costing £150,000, and Lime Street station was opened for traffic on August 15, 1836. Here again, locomotives were not allowed through the tunnel, and on the arrival of an incoming train at Edge Hill, the engine was detached and worked into a short *cul-de-sac* siding between the station and the tunnel mouth, clear of the main line. Every carriage was then illuminated by oil lamps hung outside the sliding window of the door, and the train was pushed by hand in the direction of the tunnel mouth. There an open brake-van with a guard in charge was attached, and the train descended by gravity on the falling gradient of 1 in 93. Up to 1869 the marshalling of the passenger trains at Lime Street was performed by horse power in teams of four; but in that year, owing to the increasing weight of vehicles, it was found necessary to provide locomotive power to form the heaviest trains, although horse power still continued to be used for the lighter trains. Trains from Lime Street to Edge Hill were hauled by an endless hempen rope worked by a stationary engine on the platform at the latter station, but in March, 1870, the rope working was discontinued, and since then all trains to and from Lime Street have been worked by locomotives. At the same time horse power for marshalling trains was dispensed with. The approach tunnel was almost entirely opened out in 1881.

For goods traffic cable operation in the Liverpool neighbourhood continued till the closing years of the nineteenth century. The original Liverpool goods station was at Wapping, which was reached from Edge Hill by a tunnel about 1½ miles long on a falling gradient from Edge Hill of 1 in 48. Stationary engines at Edge Hill, one on each side of the Moorish Arch originally built there, were employed to haul the traffic up to Edge Hill by means of

an endless rope. At first a hempen rope was used, and the maximum load was six wagons each averaging about 4 tons 10 cwt., including the weight of the wagon, or a total of 27 tons. No brake-van was used, and the man in charge had to ride on the front wagon holding the "messenger," a short rope secured to the travelling rope. It was soon found necessary to replace this hempen winding rope by one of steel, and to erect at the easterly side of the tunnel road stronger stationary engines. Pilot wagons were provided to travel in front of the up traffic, and the permissible train length was increased to 16 vehicles. The Wapping tunnel rope was superseded by locomotives on May 11, 1896. Another tunnel west of Edge Hill which was cable-operated for many years was that serving



*View from an old engraving of the London & Birmingham Railway showing "The excavation near Camden Town, with the stationary engine chimneys and locomotive engine house"*

Waterloo goods station. Waterloo tunnel, about a quarter of a mile long, runs from Great Howard Street to Byrom Street, and was opened in August, 1849. Goods traffic from Waterloo station to this point was worked by locomotive engine, and thence by endless steel rope and stationary engine *via* Victoria tunnel to Edge Hill. The Victoria tunnel rope broke on February 16, 1895, and since then the traffic has been worked by locomotives.

### The Camden Incline

Although cable-worked for a considerably shorter period, the Camden incline between Euston and Camden is far better known than any of the series of lines at Liverpool. The original Act of the London & Birmingham Railway fixed the London terminus at Camden Town, and the extension thence to Euston was authorised by a further Act, on July 3, 1835. When the line was opened, the stationary winding-engines at Camden (each of 60 h.p.) were not ready, and a "powerful engine" (*sic*) was hired from Robert Stephenson & Co., of Newcastle, apparently for banking up to Camden the hired Bury locomotives which worked the traffic at the start. It was not until October 14, 1837, three months after the inauguration of a regular service, that the winding system was instituted, and this continued until July 14, 1844. The endless rope, to which the trains were attached at Euston for the ascent to Camden, was 4,080 yd.



Right: A North British train ascending Cowlairst incline assisted by the rope



Below: Splicing the steel rope on Cowlairst incline, North British Railway. Braking trucks in the background



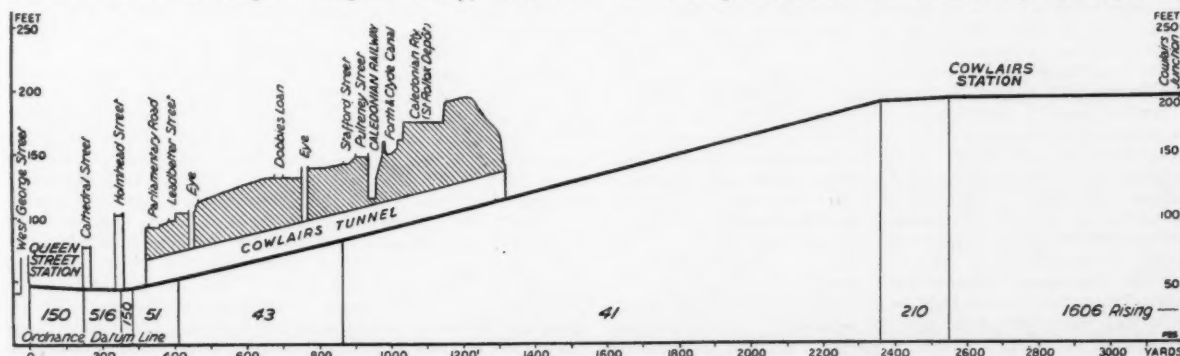
the North British Railway, and now the L.N.E.R. The Edinburgh & Glasgow Railway was opened throughout its entire length of 46 miles between Edinburgh (Haymarket) and Glasgow (Queen Street) on February 21, 1842. When the Edinburgh & Glasgow Railway projected its line to Glasgow in 1835, it intended having its Glasgow terminus on a high level, but the powerful Forth & Clyde Canal Company opposed the project and the railway thought it desirable to go below the canal instead of above it, thus rendering necessary the construction of a long tunnel and incline down to Queen Street station. The  $1\frac{1}{2}$  miles into Glasgow involved a steep descent of 1 in 41, mainly in tunnel, and from the begin-

ning this portion of the line was equipped with rope haulage actuated by a fixed engine situated at the upper end of the gradient at Cowlairst. With the exception of a very short period when unsuccessful attempts were made to use unassisted locomotive power, trains ascending the Cowlairst incline were assisted by the winding engine, although they were not hauled exclusively by this means as the locomotive was attached to the train and provided a large proportion of the tractive power required. By the use of a messenger rope, the cable was detached at the summit without the necessity for stopping the train, as the cable served only for additional haulage power while ascending the gradient and was attached to the front of the locomotive. The operation of the winding mechanism was controlled by signals given by

long and 3 in. dia. The condensing engines for winding purposes were supplied in 1838 by the well-known firm of Maudslay, Sons & Field, which also supplied about the same time some "six-coupled luggage engines" to Bury's design, for traffic on the L. & B.R. Locomotives were detached from up trains at Chalk Farm, and the trains lowered into Euston; their speed (which was not supposed to exceed 10 m.p.h. normally, and less when the train was heavy or the weather was bad) was regulated by brakemen known as "bank-riders."

#### The Cowlairst Incline

A different type of cable operation was used for many years, and well into the present century, on the Cowlairst incline of the old Edinburgh & Glasgow Railway, afterwards



Gradient profile of the Cowlairst incline, Glasgow, L.N.E.R.



*Passenger train being assisted up the 1 in 30 gradient between Erkrath and Hochdahl by a descending locomotive hauling on the other end of the cable. Cable haulage remained in use on this section until 1927. The third track, on the right of the picture, is for descending trains*

the locomotive whistle. Special brake vans were attached on the journey down the incline.

Originally a hempen rope was used, but this was subsequently replaced by an endless steel cable which required renewal at fairly frequent intervals. For example, *The Railway News* of November 22, 1884, recorded the arrival at Cowlairst in five trucks of a new wire rope which was described as being of such unusual dimensions as to merit notice. Its length was 2,300 fathoms or 2 miles 1,080 yards; its circumference  $5\frac{1}{2}$  in.; and its total weight  $21\frac{1}{2}$  tons. This had been manufactured at West Bute Docks, Cardiff, in the works of George Elliot & Company, and over 108 miles of superior quality wire had been used in its construction. It was stated that during the previous 36 years the cable longest in use on this incline lasted for only 2 years and 3 months and in no other case had the cable served for as long as 2 years. This particular new cable was placed in service on November 23, 1884. Two or three years later cables for the Cowlairst incline were supplied by Haggie Brothers of Gateshead. They were about 4,560 yd. in length, 5 in. in circum-

ference, and weighed about 23 tons. In 1887 it was stated that the average life of the wire ropes on this incline was about 12 months. Latterly the cable system cost about £5,000 a year and eventually on April 1, 1909, the North British Railway abandoned it and used banking engines at the rear of ascending trains instead. Reference to the abandonment of cable haulage on the Cowlairst incline was made in *THE RAILWAY GAZETTE* of May 21, 1909.

#### **Cable Haulage on Düsseldorf-Elberfeld Line**

An instance of trains being assisted by cable over short sections until comparatively recent years was to be seen in Western Germany on the Düsseldorf-Elberfeld line. This was the first railway in that part of the country and was opened from Düsseldorf to Erkrath 8.12 km. (5 miles) at the end of 1838 and throughout three years later. Robert Stephenson was asked to advise on the route to be taken, which was 27 km. (16½ miles) long, with a total rise of 120 m. (392 ft.). To get the best conditions for locomotives he proposed to make a continuous grade of 1 in 30 on the straight between Erkrath and Hochdahl, 2.78 km. (1½ miles) and employ stationary engine power there. This advice was taken and the line built by Friedrich Wiebe (1804-1892), later connected with many other lines, principally those through East Prussia to the Russian frontier. The stationary engine was duly installed, at considerable cost, but not used for long. Wiebe laid a second track—the line was single to begin with—and employed a locomotive descending thereon to haul on the cable and assist the ascending train. When the line was doubled this section had then three tracks, as seen in the accompanying illustration. This peculiar system of working lasted until 1927. A pneumatic system of signalling was put in between the two stations, to indicate when the cable was made fast and the train was to be set in motion, but later of course this gave place to a telegraph. A curious feature of the early regulations was that "stop" was indicated by a green light. In 1857 the line was amalgamated with the Bergisch-Märkisch Railway, and later became part of the Elberfeld division of the Prussian State Railways.

#### **Speakers that are Too Loud**

**E**VEN before the war and the blackout it was often found more satisfactory to broadcast information to passengers through the ear rather than the eye, and station loudspeakers found useful application at times of traffic pressure. Crowds of the dimensions once associated with holiday seasons and race meetings have now become almost a daily commonplace at many places, particularly after dark when thousands who have been enjoying Service leave, respite from war work, or temporary family reunions, have to return to their posts of duty. Apart from incessant questioning of depleted station staffs, the loudspeaker is then the only satisfactory method of guiding them to the proper platform and train. Unfortunately, large railway stations were not designed with a view to acoustics, so that even given a good announcer, and the minimum distortion in microphone, amplifier, and loudspeaker, the sound that reaches listening ears on platform and concourse is sometimes confused. This is often aggravated by the amount of information the announcements convey. The unvarnished statement, repeated at intervals, that the 10.20 to so-and-so will leave from No. 5 platform,

is not capable of much misinterpretation, but when the basic description of the train forms a tiny proportion of a long recital of all the stations at which it calls, and when this recital merges into an unintelligible boom the vital information may be lost.

For intelligibility, the best practice seems to be to have a number of small loudspeakers each dealing with its own platform and so sited as not to be unduly audible to passengers on others. At termini, where the listening passengers are grouped in a circulating area, considerations of interference reduce the number of loudspeakers that can be used, but it often seems that the volume and eloquence poured out from the two or three stentorian instruments resorted to in such cases defeats its own object. This is where simplified announcements and clarity of diction would help. The extending employment of women porters may give a hint in this direction, for some of the best announcements we have heard have come from these employees. In the Services women's voices have been found very suitable for radio-telephone work. Perhaps the experience acquired in training for Service purposes will found a school of loudspeaker diction for everyday purposes.

# RAILWAY NEWS SECTION

## PERSONAL

The Minister of Home Security and the Minister of Health have announced the appointment of a small executive committee to undertake the management of the new tube tunnel shelters now in course of construction at various sites in London. Sir George Wilkinson, the retiring Lord Mayor of London, has accepted the chairmanship of the committee. Other members are Lady Rhondda, Mr. I. J. Hayward, L.C.C., Miss Violet Markham, C.H., and Mr. J. P. Thomas of the London Passenger Transport Board. The executive committee will work in close co-operation with the Regional Commissioners for the London Civil Defence Region who, subject to the determination of matters of policy by the respective Ministers, are responsible for the administration of shelters in London.

Sir Robert A. Burrows, Deputy Chairman, London Midland & Scottish Railway, has accepted the Presidency of the Railway Convalescent Homes for 1942 in succession to Sir Ronald W. Matthews, Chairman, London & North Eastern Railway.

It was stated at page 336 of our October 3 issue that Mr. W. J. Lakeland had been appointed Chief Engineer of the Yunnan-Burma and Yunnan-Suifu railway constructions. Actually, he is Chief Engineer, under Sir John Rowland, of the Lashio-China Frontier railway extension, the British section of the Burma-China Railway, and not the Chinese section as stated.

Mr. L. Leighton, Principal Assistant to the Engineer-in-Chief, Mersey Docks & Harbour Board, since 1928, has been appointed Engineer-in-Chief in succession to Mr. T. L. Norfolk who has retired. Mr. Leighton was at one time a member of the Dock Engineer's staff of the North Eastern Railway, and joined the Mersey Docks & Harbour Board in 1914.

The *London Gazette* of November 11, 1941, announces the award of the Imperial Service Medal to 14 employees of the New South Wales Railway Department, and to one employee of the New South Wales Department of Road Transport & Tramways.

### L.M.S.R. STAFF APPOINTMENTS

Mr. S. Scarisbrick, Clerk (Research Office), Chief Commercial Manager's Office, Watford, to be Assistant District Passenger Manager, Leeds, *vice* Mr. T. Cresswell, retired.

Mr. T. B. Davies, Chief Commercial Clerk, District Goods Manager's Office, Liverpool, to be Goods Agent, Edge Hill, *vice* Mr. J. A. Gaukrodger, retired.

Mr. C. R. Campbell, District Locomotive Superintendent, Carlisle, to be District Locomotive Superintendent, Newton Heath, *vice* Mr. F. G. Moore, retiring.

Mr. G. H. Nelson, District Locomotive Superintendent, Accrington, to be District Locomotive Superintendent, Carlisle, *vice* Mr. C. R. Campbell.

Mr. A. H. Madden, District Locomotive Superintendent, Bank Hall, to be District Locomotive Superintendent, Accrington, *vice* Mr. G. H. Nelson.

Mr. G. F. Horne, Assistant District Locomotive Superintendent, Newton Heath, to be District Locomotive Superintendent, Bank Hall, *vice* Mr. A. H. Madden.

Mr. P. R. Angus, Locomotive Superintendent, New Zealand Government Railways, has been appointed Chief Mechanical Engineer. Mr. Angus joined the Railway Department at Invercargill in 1910 as Mechanical Engineering Cadet, and later became a draughtsman at Wellington. In 1918 he was appointed Assistant Locomotive Engineer at the Auckland railway shops. Mr. Angus became Locomotive Engineer at Greymouth on the West Coast in 1921, and in 1924 was transferred to Wellington. After a brief period as Locomotive Engineer at Christchurch, he was appointed Assistant Chief Mechanical Engineer in 1926 with headquarters at Wellington. He held this title until 1933 when the office of Chief Mechanical Engineer, which had been vacant for some years, was abolished, and Mr. Angus became Locomotive



Mr. P. R. Angus

Appointed Chief Mechanical Engineer,  
New Zealand Government Railways

Superintendent. Mr. Angus is an Associate Member of the Institution of Mechanical Engineers.

Mr. B. Rutledge, who, as recorded in our October 24 issue, has been appointed Livestock Superintendent, Great Southern Railways, Claremorris, joined the former Midland Great Western Railway as a clerk in 1908. In 1918 he was appointed Relief Clerk; in 1928 became Stationmaster at Carrick-on-Suir; and in 1930 was made Canvasser for the Western District.

Mr. Patrick Lyons, Goods Superintendent at North Wall, Great Southern Railways, has, as recorded in our October 24 issue, retired. He joined the service of the former Midland Great Western Railway in 1887 and five years later became Stationmaster at Oranmore. He served as Stationmaster at many stations until 1914 when he was promoted to be Stationmaster at Sligo, where there were then three separate companies working and where he was responsible for canvassing of traffic in a large area. Fifteen months later Mr. Lyons was selected for the position of Goods Agent at North Wall in succession to the late Mr. William Smith,

who had been appointed Accountant to the Midland Great Western Railway. On leaving Sligo Mr. Lyons was entertained in the Town Hall by the Mayor and Corporation and merchants of Sligo, including two directors of his own company. On the amalgamation of the Irish railways Mr. Lyons's duties were considerably enlarged, as the control of the Great Southern & Western Railway depot at North Wall was placed under him, and the Dublin & South Eastern goods traffic formerly dealt with at Harcourt Street depot was transferred to North Wall.

Mr. Robert Fennell, District Superintendent, Westland Row, Great Southern Railways, has, as recorded in our October 24 issue, been appointed to succeed Mr. P. Lyons as Goods Superintendent at North Wall. Mr. Fennell joined the former Dublin & South Eastern Railway as a clerk in 1902 at Wexford and served at many stations on that railway and became Chief Goods Clerk at Wexford in 1914. He was promoted to Stationmaster at Ferns in 1915, and was subsequently promoted to Enniscorthy station where, in addition to his ordinary duties, he was withdrawn at different times for canvassing. He was appointed District Superintendent at Westland Row in 1933.

### MEMORIAL SERVICE FOR MR. FRANK PICK

A memorial service for Mr. Frank Pick was held on Thursday, November 13, at St. Peter's, Eaton Square. In addition to members of the family, others present included:—

Lord Ashfield (Chairman), Colonel Forrester Clayton, Mr. Charles Latham, Mr. John Cliff, and Brigadier-General Sir Henry Maybury (representing the London Passenger Transport Board), Mr. C. G. Page, Mr. Ivor Fraser, Mr. R. McDonald, Mr. V. A. M. Robertson, Mr. T. E. Thomas, and Mr. L. C. Hawkins (heads of departments, L.P.T.B.). Mr. F. H. Keenlyside (representing the Minister of War Transport), Sir Cyril Hurcomb (Director General, Ministry of War Transport), Mr. R. H. Hill (Director-General, Inland Transport), Mr. Gilbert J. Ponsonby (representing London School of Economics and Mines Department, Board of Trade), Sir Harry Vanderpant (London & Home Counties Traffic Advisory Committee), Mr. E. Rawdon-Smith (British Overseas Airways).

Mr. K. W. C. Grand (representing Sir James Milne, General Manager, Great Western Railway), Mr. F. E. Bailey (representing Sir William V. Wood, President, L.M.S.R.), Mr. T. E. Brain (representing the Chairman and Directors, Southern Railway Company), Mr. C. H. Newton (Chief General Manager, L.N.E.R.).

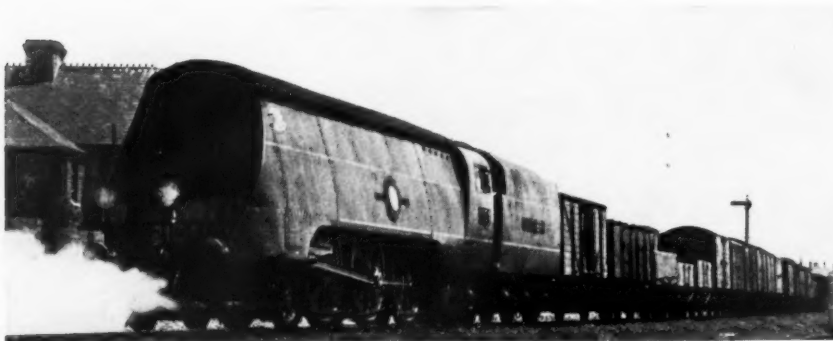
Mr. W. H. Gaunt (President, Mansion House Association on Transport), Mr. G. Cole-Deacon (Railway Executive Committee), Mr. W. H. Halford (representing Mr. M. J. Railing, Vice-Chairman, General Electric Company), Mr. A. H. Jackson (representing Mr. A. H. Railing), Sir Joshua Scholefield, K.C. (Chairman, Railway Assessment Authority), Sir Ralph Wedgwood, Mr. F. J. Hills (Metropolitan-Cammell Carriage & Wagon Co. Ltd., also representing Mr. A. J. Boyd), Mr. F. W. Dalley (Railway Clerks' Association).

Mr. C. E. R. Sherrington (Railway Research Service), Mr. S. R. Hobday (President, Canal Association), Mr. Walter Sedgwick (Dock & Harbour Authorities Association), Mr. J. Marchbank (General Secretary, N.U.R.), Mr. W. T. Halcrow, Mr. J. A. Kay (THE RAILWAY GAZETTE), Mr. C. F. Haywood (*Bus & Coach*), Mr. C. J. Selway (Railway Executive Committee), Major R. A. B. Smith (Commercial Motor Users' Association), Mr. J. S. Nicholl (Institute of Transport), Mr. L. G. Oldfield (Omnibus Owners' Association), and many representatives of the London Passenger Transport Board's administrative and uniformed staffs.



## SOUTHERN RAILWAY PACIFICS AT WORK

*The new 4-6-2 "Merchant Navy" class 3-cylinder general-service engines are now in service on heavy goods haulage on the West of England main line*

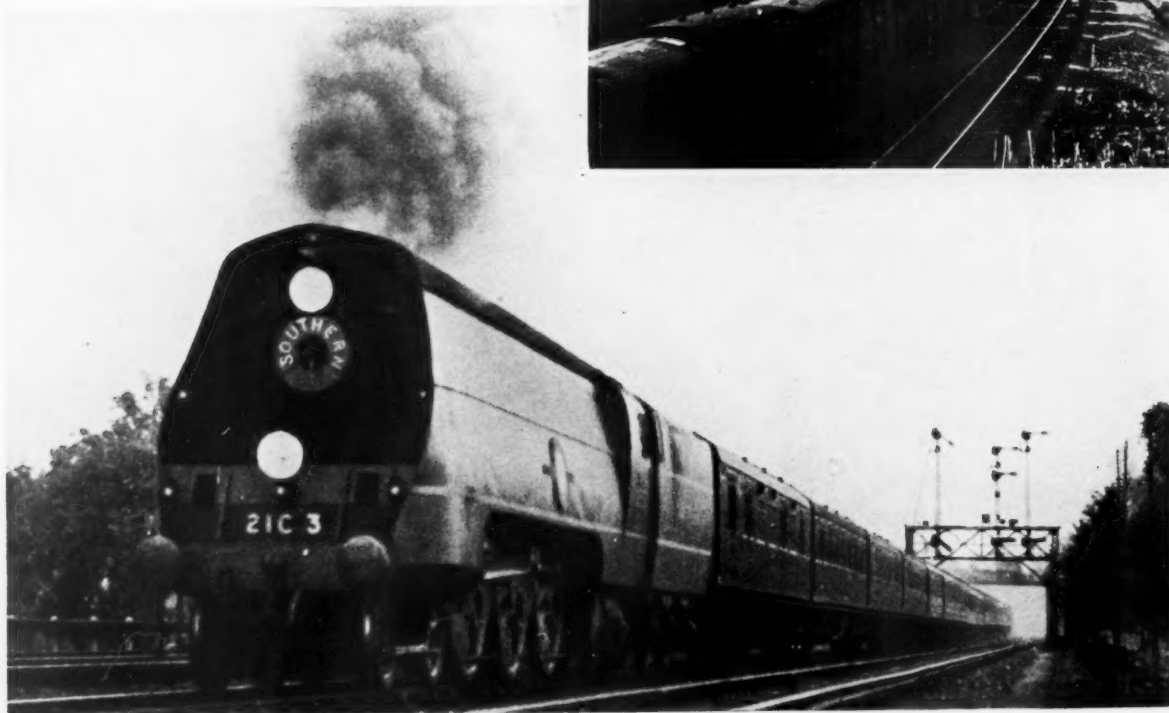


*Above : No. 21 C 1, "Channel Packet," leaving Salisbury*

*Right : Climbing the 1 in 80 of Honiton bank*



*Below : No. 21 C 3, "Royal Mail," on the trial trip of November 9 when a 530-ton passenger train was hauled between Waterloo and Exeter*



## TRANSPORT SERVICES AND THE WAR—116

### *Restricted areas—Easing workers' travel—Larger wagons for Reichsbahn—Sabotage in Poland—Balkan rail services—French railway conditions*

In pursuance of a decision of the Government, the Regional Commissioner for the Eastern Region has suspended, from November 7, 1941, until February 15, 1942, the ban on visits to the coast between the Wash and the Thames. Similarly, the Regional Commissioner for the South-Eastern Region has suspended the ban on visits to the coast from Littlehampton to Hastings both inclusive. This partial suspension of the restrictions is temporary, and may be cancelled at any time before February 15. No additional transport facilities will be made available. The ban remains in force:—

- (a) In the Isle of Wight;
- (b) In that part of Kent now subject to it, namely, the whole of the county except —
  - (i) those parts within the Metropolitan Police District;
  - (ii) the Borough of Tunbridge Wells;
  - (iii) the urban districts of Orpington, Sevenoaks, Southborough, and Tonbridge;
  - (iv) the rural districts of Sevenoaks and Tonbridge; and
- (c) In that part of Sussex east of Hastings and extending northwards to the Kent boundary.

A fresh restriction has been imposed from November 14 in the area where the ban remains in force, and will apply in the temporarily de-restricted areas as soon as the ban is reimposed. Under this restriction persons wishing to take up permanent residence must, unless they are already domiciled in the area, satisfy the police of the area concerned that they have good cause for so doing. In the areas where the ban is temporarily suspended, anyone, not already domiciled in the area who now enters, unless he has obtained the permission of the police to remain, may have to leave at any time, and will be obliged to leave before February 15.

#### Further Railway Wartime Improvements

Although it is not desirable in present circumstances to publish precise details, it is known that many improvements to the British railways have been effected to facilitate the conveyance of war transport. This policy is still being pursued, and works recently completed by the main-line railway companies with the approval of the Minister of War Transport include laying additional lines and sidings; enlarging shunting yards; building new bridges and strengthening existing structures so that they will carry the heaviest loads; and installing additional signalling and telephone equipment. These works will greatly assist the railways in operating war traffic during the coming winter months.

#### Essential Work Order for Railways

As was recorded in THE RAILWAY GAZETTE of November 7, the Essential Work (General Provisions) Order, 1941, with certain modifications relating to disciplinary arrangements, has been applied to the controlled railway undertakings with effect from October 27. The purpose of the Order is to prevent loss of production due to unnecessary turnover of labour or absenteeism. The Minister may schedule an undertaking if he is satisfied that it is expedient to do so as a measure for securing the defence of the realm, or for the efficient prosecution of the war, or the maintenance of supplies or services essential to the life of the community. Any undertaking which satisfies these requirements may be scheduled provisionally for three months at a time, but before placing an undertaking more permanently on schedule the Minister must be satisfied: (a) that the terms and conditions of employment of persons employed by the undertaking are not less favourable than those provided by the Conditions of Employment & National Arbitration Order, 1940; (b) that there is satisfactory provision for the welfare of persons employed; and (c) where, in the Minister's opinion, it is necessary that provision should be made by the undertaking for training workers, that this provision exists or is in course of being made when the undertaking becomes subject to the Order. The effects, briefly, are that the right of the management to discharge, or of the personnel to leave, is strictly controlled, and is in general subject to permission of a National Service Officer, and to at least one week's notice; a guarantee of a certain minimum time rate of wages is given subject to specified conditions; and cases of alleged absenteeism are dealt with under a special procedure. It is made clear in the Order that if in any case terms or conditions of employment more favourable to the person employed than the minimum wage guaranteed by the Order are provided for by a collective agreement, the right to those terms is not prejudiced. In the case of undertakings carried on by Government

departments the Order contemplates that conditions substantially similar to those required from private employers will be observed by the undertaking when placed on the schedule. The Order lays down a general set of conditions, but it is up to employers and workers' organisations jointly to submit to the Minister any alterations to suit the conditions of any industry; this course has been taken by the railway companies and railway unions.

#### First British Locomotive in Turkey

The first British locomotive in Turkey arrived in Ankara on November 6 pulling a train of British wagons, and was inspected by the Turkish Minister of Communications. So far Britain has delivered about 200 wagons to Turkey, according to Reuters.

#### Trains for Factory Workers

Extra trains run by the L.M.S.R. for workers at Government factories now total 267 a day. On Sundays no fewer than 209 special "workers only" trains are operated. These are additional to the large number of services used by workers at factories not directly under Government control.

#### Travel Rationing in Glasgow Area

Alterations in the minimum fares for certain sections of bus routes were made by the Western S.M.T. Co. Ltd. on Sunday, November 9, under the conditions laid down by the Ministry of War Transport for rationing travel. The changes affect short-distance routes in Glasgow and its outskirts on which there are alternative means of travel by rail and municipal bus and tram. On such routes the bus fares of the Western S.M.T. are now higher than those for tram. Period tickets giving unlimited travel over short-distance routes were withdrawn as part of the scheme of modifications. For example, in place of the weekly ticket of this category, there is now a weekly available for two return journeys daily except Sunday, but the price remains unchanged.

#### Sheltering in London Tubes

It was stated in the House of Lords on October 15 that bunks had been installed in public shelters in 80 London tube stations and accommodation was provided for 23,000 persons; more were on order. The first of the new London tube shelters, which will hold about 9,000, is to be opened towards the end of



**WATCH YOUR STEP  
IN THE BLACKOUT**

Most of us are impetuous. If you jump now you may save walking back ten yards. But if you fall, then you may not be able to walk at all.

**LOOK OUT IN THE BLACKOUT**




**OUTSIDE IT'S DARK**  
Let your eyes get used to it

Pause for a minute or so when you leave an Underground station at night. Your eyes will gradually get used to the dark and objects will begin to take shape which were invisible when first you came out into the night.

**LOOK OUT IN THE BLACKOUT**



Two newspaper advertisements issued by the L.P.T.B. stressing the need for care in the blackout

this month. Eight further tube extensions are due to be completed early in the New Year. Work on these tunnels in various parts of London has been in progress most of this year. The new extensions will provide room for 75,000 to 80,000 more persons. As we have previously recorded, all the new tunnels have been so planned that they can be used after the war as additions to the London tube railway system.

### Reichsbahn Orders Larger Wagons

In order to deal with the cereal traffic, the German State Railway is reported to have placed in service recently a number of high-capacity wagons, loading 40 to 50 tonnes. The tracks of a considerable number of Reichsbahn and privately-owned sidings have been strengthened, and additional appliances for loading and discharge have been installed.

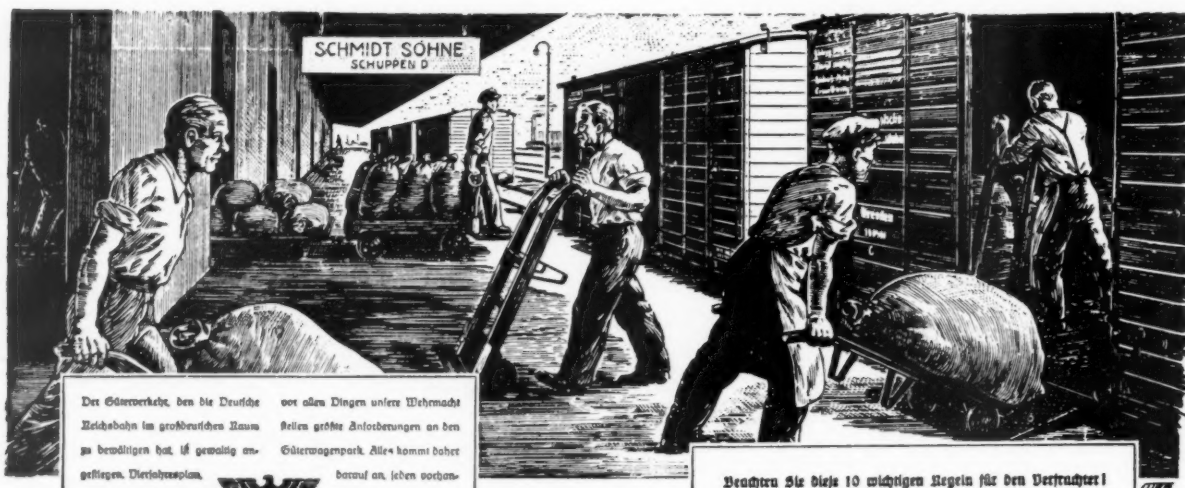
### Freight Traffic in Germany

Herewith is the fourth of the series of advertisements issued by the German State Railway to encourage more rapid and efficient use of freight rolling stock:—

#### EVERY HOUR IS OF MOMENT

Has it ever crossed your mind that out of 24 hours (on an average for the year) a goods wagon stands fully 16 hours with the sender and receiver, leaving only 8 hours for its real purpose, namely, carrying? With every hour, nay, with every half hour, by which the standing time of a vehicle is reduced at the sender's or receiver's end, the number of wagons available for goods carrying is increased, and consequently also the quantity of goods carried daily. The sooner loading and unloading is completed, the sooner will you yourself benefit from this wagon being available again for goods traffic. Please therefore make all preparations in good time for the loading and unloading, so that the work can be begun immediately the vehicle is ready and completed as quickly as possible. The use of loading gear not only saves time but also manual labour. For the purpose of expediting the removal, the German Reichsbahn has introduced a system of preliminary advice. This makes it possible to advise the receiver during business hours of the arrival of the wagons which will come in during the night. This accordingly enables the receiver to make all preparations so that the unloading can be begun at the beginning of the loading time. Please get in touch in good time with the Traffic Manager or with the local representative for short distance traffic if you are short of vehicles for the delivery and removal of the goods. The movement of wagons must not be delayed through the lack of lorries and labour.

Help the German Reichsbahn and help yourself



Der Güterverkehr, den die Deutsche Reichsbahn im großdeutschen Raum zu bewältigen hat, ist gewaltig angetrieben. Hierzulande, in den Reichsbahn-Verkehrsgebieten, ist die Beförderung der Güter ein wichtiger Bestandteil der Volkswirtschaft. Um den Güterverkehr zu beschleunigen, ist es notwendig, die Wagen zu den richtigen Zeiten an den richtigen Stellen zu haben. Dies erfordert eine sorgfältige Planung und eine enge Zusammenarbeit zwischen den verschiedenen Beteiligten. Nur so kann der Güterverkehr effizient ablaufen und die Bedürfnisse der Wirtschaft erfüllt werden.

## Auf jede Stunde kommt es an!

Haben Sie schon einmal bedacht, daß während 24 Stunden (im Durchschnitt des Jahres) ein Güterwagen volle 16 Stunden bei dem Abnehmer und Empfänger steht und daß nur 8 Stunden für seine eigentliche Zweckbestimmung, die Beförderung, übrigbleiben? Mit jeder Stunde, ja mit jeder halben Stunde, um die die Stillstandszeit eines Güterwagens beim Abnehmer oder Empfänger vermindert wird, wächst die Zahl der zur Güterbeförderung verfügbaren Wagen und damit die Menge des täglich beförderten Gutes. Je schneller die Be- und Entladung eines Güterwagens beendet ist, um so eher kommt dieser Wagen im Kreislauf des Güterverkehrs Ihnen wiederum selbst zugute. Treffen Sie daher alle Vorbereitungen für das Be- und Entladen so frühzeitig, daß unmittelbar nach der Bereitstellung des Güterwagens die Arbeit beginnen kann und so rasch als möglich beendet ist. Durch den Einfluß von Ladegeräten kann nicht nur an Zeit, sondern auch an menschlicher Arbeitskraft gespart werden. Zur Beschleunigung der Abfuhr hat die Deutsche Reichsbahn die Voranlieferung eingeführt. Dieses Verfahren ermöglicht es, die Empfänger noch vor Schluß des Tages vom Eingang der Wagen zu benachrichtigen, die während der Nachmittagsstunden eingegeben werden. Der Empfänger kann hierauf alle Vorbereitungen treffen, damit bei Beginn der Ladearbeit gleichzeitig mit dem Entladen begonnen werden kann. Nehmen Sie rechtzeitig mit dem Sachbearbeiter der Reichsbahn oder mit dem örtlichen Bevollmächtigten für den Güterverkehr Kontakt, wenn es Ihnen an Fahrzeugen für die An- und Abfuhr der Güter fehlt. Der Wagenlauf darf nicht durch das Fehlen von Abfahrts- und Ladepersonal verzögert werden.

Hilf der Deutschen Reichsbahn und Du hilfst Dir selbst!

The fourth of the German State Railway freight traffic advertisements

### Double Railway Insurance in Poland

An NPS despatch from Geneva to the *Nowy Swiat* of September 18 quoted from a fortnightly journal published by the Reichsbahn an article on the difficulties of moving heavy goods on the railways in Poland. In view of "the uncertain situation" on many of the lines linked up with the German railway network, it had been found necessary to impose a special additional insurance, amounting to 4½ per cent. on all freight sent from Germany to the occupied territories, and on all raw materials moved in the opposite direction. It was noted that the risk had grown in August far beyond that of July.

### Sabotage in Poland

According to a P A T telegram to the *Dziennik Polski* of October 24, an attack by Polish guerrillas on the office of the German Military Co-operative in Zamosc was described in the *Krauer Zeitung* of October 16. The attackers are said to have succeeded in taking 9,000 zlotys from the cash box, and the watchman in charge was wounded. The same paper reported the trial of eight Poles in the Poznan courts for attacks made on the main Berlin-Warsaw railway line, and on goods trains at Poznan, Lodz, and Warsaw itself; five of those charged were condemned to death. On the subject of sabotage of transport, N P S reported from Stockholm to the *Nowy Swiat* of September 9 an account, which appeared in *Nya Dagligt Allehanda*, telling of the derailling, between Breslau and Warsaw, of four goods trains loaded with equipment and provisions for the Eastern front. In one case a train bringing troops back from the front collided with a goods train, and some scores of persons were killed. Each one of these "accidents" is stated to have caused serious damage to the permanent way. The estimate was made that during August there had been 128 railway accidents in various parts of Poland. The Germans are stated to have doubled the number of guards placed along the lines.

### Resumed Railway Services in Yugoslavia

Railways in the territories seized by the Axis powers from Yugoslavia and handed over to Bulgaria, as summarised in THE RAILWAY GAZETTE of July 18, 1941, page 68, have been so far

#### Beachten Sie diese 10 wichtigsten Regeln für den Verfrachter!

1. Güterwagen (Schwämme) be- und entladen. Rückgabe der Wagen möglichst vor Ablauf der Ladefristen. Übermittlung der Ladefristen hat Zusatzvermittlung Ladeweise zur Folge.
2. Wagen rechtzeitig und nur für den tatsächlichen Bedarf bestellen. Angeordnete Erlösse verwenden, selbst wenn kleine Unbequemlichkeiten damit verbunden sind.
3. Pünktliche An- und Abfuhr der Güter. Mit der Be- und Entladung gleichzeitig nach Wagenbereitstellung beginnen.
4. Für Güterwagen gilt es kein Sonntagsverbot. Daher Güter, wenn möglich, auch Sonntags verladen, für eingegangene Güter besteht die Pflicht zur Entladung am Sonntag.
5. Güterwagen beim Be- und Entladen nicht beschädigen. Lademaße einhalten. Güter ordnungsgemäß und benutzbar verladen.
6. Durch zweckmäßige Lagerung und Hilfsmittel das Be- und Entladen erleichtern.
7. Auslastung der Wagen bis zum Ladegewicht und nach Möglichkeit bis zum inneren deutschen Gewicht bis 1000 kg über die am Wagen angegebene Tragfähigkeit. Raumersparnis durch geschicktes Stapeln der Güter, ganz besonders durch sorgfältiges und überlegenes Verladen (verpacken) Güter.
8. Nicht mehr Güter zu gleicher Zeit beordern, als rechtzeitig entladen werden können.
9. Entladung möglichst beim Eingang der Verladungsbereitschaft des Abnehmers oder bei der Voranlieferung durch die Güterabfertigung organisieren. Führer und Ladepersonal schon im voraus für die Zeit der bevorstehenden Entladung festhalten.
10. Sachbearbeiter und sonstige Begleitpersonen sorgfältig aufklären zur Deckschaltung von Jockeln.

Diese maßgebenden, aufrechten und immer wiederkehrenden!



repaired that on September 15 the following sections were reopened to public traffic:—

Tarabrod to Bela Palanka, 54 km. (34 miles), the section of the Nish line now in the hands of the Bulgarian State Railways.  
Leskovac to Ghevgheli, 330 km. (205 miles), the Yugoslav section of the Belgrade-Skopje main line, now in Bulgarian hands.  
Skopje to Kacanik, 36 km. (22 miles), part of the Skopje-Kraljevo line.  
Veles to Kocane, 87 km. (54 miles).  
Skopje to Ohrid and Struga (Tasmorunisle), 241 km. (150 miles), of narrow-gauge line.

The intervening sections in Serbia, namely, Bela Palanka to Nish (45 km., or 28 miles), and Leskovac to Nish (44 km., or 27 miles), are also in operation. It will be noticed that the "frontiers" between Bulgaria and Serbia are slightly more favourable to Bulgaria than at first reported. Bela Palanka is 17 miles nearer Nish than Pirot, which was named earlier; and Leskovac is 41 miles nearer Nish than the suggested boundary at Vranje. Recent, and more detailed, references to the present "frontier" stations have been made in our issues of October 17 (page 393), and November 7 (pages 482-3).

Of the new lines upon which construction work was begun immediately after the cessation of regular fighting, the Gueschevo-Kumanovo line in Serbia, and the narrow-gauge Kulata (Rupel)-Demirhissar (Siderocastro) line in Macedonia, are so far advanced that their opening before the end of 1941 has been announced.

#### Railway Construction in North and West Yugoslavia

In Croatia, the second track on the line from Zagreb to the German frontier is nearing completion.

A new line from Metkovic to Ploce, a port on the Adriatic, is stated to be in an advanced state of construction.

#### Roumanian Frontier Traffic

In accordance with recent instructions, the frontier stations of Floreni, Sanpaul, Bahnea, Tunel, Prejmer, and Palanca are open only to traffic for which special permission has been granted.

#### New Bulgarian Railway Projected

Bulgaria intends building a new railway line, approximately 80 km. (50 miles) long, to connect the Lower Danube with the Black Sea. The project envisages a standard-gauge line branching off at Razgrad on the Russe-Varna line (58 miles to the south-east of Russe), and leading to Silistria, a Danube port in the Southern Dobrudja territory which Bulgaria took over from Roumania in August, 1940. The Russe-Varna line is the oldest railway in Bulgaria. Its whole length of 275 km. (171 miles) was doubled in 1940, mainly with a view to facilitating the transport of Caucasian oil to the Germans. According to this plan, the oil was to have been ferried from Batoum (the terminal port of the Baku pipe-line on the eastern shore of the Black Sea), to Varna and thence conveyed by rail to Russe, whence it would have been conveyed to Germany by River Danube shipping. It is possible that the Germans still hope to use such a route, if and when they secure control of the Caucasian oilfields.

#### Bulgarian-Occupied Greek Territory

As the result of an agreement recently concluded between Bulgaria and the local Government in Greece, traffic is shortly to be resumed on the railway from Salonica eastward to Alexandroupoulos (to which the Bulgarians have restored the previous Turkish name of Dedeağatch), and thence towards the Turkish frontier. The frontier of occupation cuts this standard-gauge railway 1.8 miles (3 km.) to the west of Poroi station (the Greek Rodopolis) which is situated about 9.3 miles (15 km.) to the east of the eastern shore of Lake Doiran, and 60 miles (90 km.) from Salonica. Negotiations are continuing between Greece and Bulgaria, as the Bulgarians are desirous of obtaining running powers over the Greek section from Poroi westward and connecting at Karasouli station with the line from Salonica to Idomeni (Greek frontier station), Djedjelija (Yugoslav frontier station) now in Bulgarian-occupied territory, and thence to Skopje. The connecting link between the Salonica-Alexandroupoulos and the Salonica-Skopje lines was not worked in peacetime, and was indicated as abandoned on our map published at page 178 of THE RAILWAY GAZETTE for February 14, 1941. It branches off at Kilindir, south of Lake Doiran, and its length to Karasouli is 18.6 miles (30 km.). The running powers sought by the Bulgarians would greatly improve their railway communication between the territory they occupy along the Aegean shore and southern Yugoslavia.

#### Reductions of French Train Services

Train services in the whole of France were curtailed on October 6, as a result of the increasing shortage of coal and lubricants. To enable additional savings to be made, train speeds were reduced by as much as 15 per cent., and it has been announced that a further reduction of the train services is envisaged to the extent of 30 per cent. of the present volume of traffic. This additional reduction may come into force without notice any day according to the development of the situation. Under the present restriction many express trains run only on 3 or 4 days a week, and on less important lines only one train a day each way is operated. Coaches are not

heated unless the temperature falls below minus 5° Centigrade (23°F.). A factor which contributes to the deterioration of the coal situation is the priority of supply which industry enjoys. The occupied zone is said to be better off so far as coal is concerned, since not only are the best and most productive coal areas concentrated in the northern provinces, but coal supplies are allowed to reach the country from the neighbouring Belgian coalfields. The situation is even more serious with regard to lubricants, as the French railways are wholly dependent upon imports. A further step to reduce traffic is the extension over the whole of France of the system of "travel certificates" which has been used experimentally on various main lines for some months past, and which is stated to have proved satisfactory. Earlier reference to this method of rationing travel was made at page 86 of our July 25, 1941, issue, in a review of the French railway situation.

#### Results and Conditions on French Railways

Traffic receipts on the French National Railways—excluding the Alsace-Lorraine lines of the Eastern Region—during the second quarter of 1941 showed increases of 2 per cent. as compared with the corresponding period in 1939\* and 18 per cent. above those for the first quarter of 1941. These results are due to the fact that the abolition of all cheap fares and increases in goods and mineral rates varying from 10 to 65 per cent. are beginning to influence results. As a general increase in fares came into force on July 28, even higher revenues should be recorded in the third and subsequent quarters. Wagon loadings in the second quarter of 1941, although they were 30 per cent. lower than in that quarter of 1939, were 6 per cent. above those for the first quarter of the current year; the corresponding volume of goods carried was also 30 per cent. below 1939.

Goods traffic fluctuations are believed to be due largely to France's "economic collaboration" with Germany, or to the extent of orders placed by Germany with French industry, and to traffic in raw materials from Germany to France to enable the latter's industries to fulfil those orders. Curtailment of road motor traffic due to lack of petrol also has the effect of increasing railway traffics.

The French railways are, however, faced with increasing difficulties in working due to insufficient supplies of lubricants and the almost total cessation of renewals at the present time, despite increased wear and tear, and the outlook with regard to coal supplies is also disturbing. The largest sources of coal supply are in German-occupied territory, and, as in the case of lubricants and replacements, the Germans have first call on the coal output. Quantity and productivity of labour in the coalfields is also diminishing either due to under-nourishment or to unwillingness to work for the Germans in so far as this is possible. In view of the difficult winter ahead the general outlook is regarded in responsible quarters with considerable concern.

#### Dog Transport in France

It is reported that the use of dogs for transport has now been resumed in Paris; the practice has been banned in France for many years.

#### Five Branches of the Murmansk Railway

The recent Finnish Government note to the British Government is stated to have referred to the existence of five "secret" branch lines leading from the Murmansk Railway towards the Finnish frontier. According to Swedish information these branches are (from south to north): (1) Petrozavodsk-Suojärvi, a distance of 110 km. (68.3 miles); (2) Paravodna-Rukajärvi; (3) Louhi-Kiestinki; (4) Kandalaksha-Salla; and (5) a line leading from Kandalaksha in a north-westerly direction towards Petsamo, which would have a length of about 250 km. (155 miles) when completed. The Kandalaksha-Salla line was to be linked up with the Kemijärvi-Salla railway being built by the Finns under the provisions of the Russo-Finnish treaty of March, 1940, and by no stretch of imagination could it be considered secret.

#### Alternative to Part of the Burma Road

A new highway about 220 km. (137 miles) in length has recently been completed between Loshan (Kiating) in Szechwan, and Sichang (Sichong) in Sikang Province. The new road is through difficult mountainous country and its construction is said to have cost hundreds of lives. This road is a part of the projected highway to connect Chengtu (and Chungking) in Szechwan with the Burma Road and railway at Kunming, via Sichang, as a safer alternative to the Suifu route farther east, used by the new railway and existing road.

#### B.B. & C.I. Gift of Fourth Fighter Plane

The Bombay, Baroda & Central India Railway staff has not slackened in its war effort, and has just given its fourth fighter plane to the R.A.F. This railway was the first in the Empire to give a war plane, and is believed to be the only railway to have been honoured with a beautiful plaque by the Ministry of Aircraft Production. The B.B. & C.I.R. staff has also presented two

\* Figures for 1940 are not available

ambulances, and has given large sums of money to the Indian Red Cross.

#### Railways at National Defence Exposition, New York

Member roads of the Eastern Railroad Presidents Conference, through the Committee on Public Relations of that body, placed a special exhibit at the Civilian & National Defence Exposition, held at Grand Central Palace, New York, from September 20 to October 18, showing the vital part that the railways play in the national defence programme. Their exhibit included an operating model of a three-track railway system, complete with passenger station, signal gantry, coal chute, water tank, stock yards, freight house, and crossing gates, with streets through a typical business district. Two goods trains and a passenger train were working regularly.

#### New York Canteen for Armed Forces

A canteen serving inexpensive light refreshments and providing tables for letter writing was opened at Pennsylvania station, New York, on September 29, for the exclusive use of soldiers, sailors, and marines in uniform, and their friends and relatives accompanying them. The canteen located near the incoming train bulletin board, is operated by the Union News Company in co-operation with the Pennsylvania Railroad. Civilians, unless accompanied by servicemen in uniform, are not permitted to use the facilities. Available at the canteen are sandwiches at 10 cents each, coffee at 5 cents per cup, soft drinks at 5 cents per bottle, ice cream at 5 and 10 cents, and other light refreshments. Cigarettes, tobacco, post cards, and letter paper are also on sale at reasonable prices and guests are encouraged to use the convenient tables for writing letters. The canteen is open daily from 9 a.m. until midnight.

#### U.S.A. Ordnance Plants: 1,356 Miles of New Railway

Colonel L. R. Groves, Chief of the Operations Branch of the U.S.A. Quartermaster General's Construction Division, in a recent address, stated that, to date, some 1,356 miles of new railway had been required to serve the new ordnance plants completed or under construction in various parts of the States. In addition, at least 1,000 miles of new highway have been built. An outstanding example quoted by him was the case of the Ravenna Ordnance plant in Ohio, which is served by 123 miles of new railway. When the contract for building the plant was placed it was estimated that 35 miles of line would suffice, but continual increases in storage facilities, manufacturing areas, and loading line capacity have necessitated the present mileage. Colonel Groves paid a tribute to the railways for their co-operation in the construction of new lines, in the handling of supplies for plant construction works, and in the facilities afforded to the construction staff, such as the issue of season tickets and running of special trains.

#### Rapid Railway Construction for American Army

On December 5, 1940, the first sod was turned in the construction of a 20-mile railway in difficult country, over which the first passenger train ran on April 19, 1941. This record was established when the St. Louis-San Francisco Railway built on behalf of the U.S. Government, a new branch line from Bundy junction—2½ miles west of Newburg, on the Eastern Division of its main line—to Fort Leonard Wood, a new military training centre now accommodating 40,000 troops high up in the Ozark Mountains.\* Despite intense cold, snow rain, and mud, some 1,900,000 cu. yd., including nearly 500,000 cu. yd. of solid rock, were excavated by hundreds of machines and thousands of men, mainly in the 12 weeks from January 23, 1941, onwards. Bundy junction is 697 ft. above sea level, and the new line, swinging southwards, climbs with a ruling grade of 1 in 44 to Oak Flats, a divide at an elevation of 1,075 ft. A similar descent to Big Piney river, 700 ft. altitude, is then followed by a more gradual but much longer climb to the terminus at Fort Leonard Wood, 1,118 ft. above sea level. There are 70 curves of which the sharpest is 8-deg., about 11-ch. radius.

The largest individual works were Summit cutting 3,150 ft. long, 46 ft. deep and involving the removal of 105,000 cu. yd. of rock and sandstone and 83,000 cu. yd. of earth, and the embankment at mile 17½, 62 ft. high and containing 141,800 cu. yd. of rock and earth. There are also three steel truss span bridges totalling 468 ft. in length, and 16 timber trestle viaducts aggregating 3,681 ft. Four crossing loops each 2,000 ft. long are provided.

To accomplish all this in the time, it was necessary for work to proceed in three shifts in the 24 hr. and, whereas the many machines arrived on the job each with a skilled driver, it was necessary to train mechanics and greasers to drive them during the second and third shifts, and unskilled labourers had to replace the mechanics and greasers. Thus a large proportion of the 3,000 men at work under the supervision of 60 engineers was at first completely untrained in its new duties and had to be taught on the work. Nevertheless progress was never checked, and rapid consolidation of the

fills was effected by heavy rollers with cleats. The platelaying was done by five groups of gangs working simultaneously on different sections of the line. Though normal traffic is expected to average only six trains each way daily over the new line, the War Department stipulated that it must be capable of moving the whole strength of the camp in troop trains if necessary. Consequently, a system of upper quadrant semaphore automatic block signals has been installed. The whole work, which would normally have taken about two years, was thus completed in 4½ months under the supervision of Mr. R. F. Bundy the Chief Engineer of Construction and generally under Colonel Frank G. Jonah, Chief Engineer of the St. Louis-San Francisco system.

#### American Experts and Lorries for China

Three American highway experts recently visited China to advise the Chinese authorities upon the improvement of transport on the Burma Road. On return to the U.S.A. they will report to the President's financial adviser, and it is probable that thirty American transport experts will then go to China to revise the existing system of highways in that country. It is reported that the Chungking Government has purchased 1,000 2½-ton lorries under the Lease-Lend Act, under which also the thirty experts would be paid.

#### Engineers' Defence Board in New York

A new organisation, known as the Engineers' Defense Board has been formed in New York City by seven national (U.S.A.) engineering societies to deal with technical problems on shortages, substitutions, conservation, raw materials, production, and reclamation, in order to assist the defence effort. Five representatives each have been appointed by the American Society of Civil Engineers, the American Institute of Mining & Metallurgical Engineers, the American Society of Mechanical Engineers, the American Institute of Electrical Engineers, the Society of Automotive Engineers, and the American Institute of Chemical Engineers. The new organisation, which will assist the various branches of government with engineering knowledge and experience on questions connected with military preparedness, will function as a clearing house for engineering information dealing with defence, particularly in relation to shortages. Representatives appointed by the American Society of Civil Engineers are: Messrs. Carlton S. Proctor, consulting engineer, executive committee representative; Richard E. Dougherty, Vice-President of Improvements & Developments, New York Central Railroad; Charles F. Goodrich, Chief Engineer, American Bridge Company; Robert R. McMath, Chairman of the board, Motors Metal Manufacturing Company; and J. P. H. Perry, Vice-President, Turner Construction Company.

#### Novi Sad Railway Bridge, Yugoslavia

The main line from Belgrade to Budapest crosses the Danube in Yugoslavia to the north of Petrovaradin, 71 km. (44 miles) from Belgrade, and just after Petrovaradin Dunav (Danube) station, 3 km. (1.9 miles) further north. On the northern bank of the Danube is Novi Sad, 76 km. (47 miles) from Belgrade. The Danube was crossed by a steel bridge for both railway and road traffic, and this bridge the Yugoslav forces blew up in their retreating fight. Only the northern span, 76 m. (249 ft. 3 in.) long, remained between the bank and the first pillar, and the whole of the remaining portion of the bridge—a length of 333.5 m. (1,094 ft.), weighing 5,400 tons—fell into the river. The structure lying between the first and third pillars from the northern bank (now in Hungarian occupation) is being lifted at present by the salvage service of the Hungarian State Railways. The structure lies about 10 m. (33 ft.) deep and proves a great hindrance to shipping. It is hoped to clear the waterway between the first and third pillars before ice-drifting sets in on the Danube, usually by the beginning of December. The southern bank is in Croatian occupation, and the Croatian State Railways have asked the Hungarian State Railways to clear the wreckage lying close to the southern bank. This, it is stated, will be done only after the Hungarian-occupied side is cleared. Thus Croatia will have to wait until the thaw sets in next spring.

#### Spanish Air Services

The same Junkers 52 three-engined aeroplanes, with a capacity for 16 passengers, which fly the Iberia Company's Madrid to Grand Canary route are used, between flights, for the Grand Canary to Tenerife service on Thursdays and Fridays. This Iberia mail and passenger air service between Gando airport, Grand Canary, and Los Rodeos airport, Tenerife, Canary Islands, which had been suspended, was resumed at the end of June last. The Iberia line has announced that the Madrid to Grand Canary service is being increased to two flights each week, and also that between Grand Canary and the island of Tenerife.

The Iberia Company, which was reorganised recently, had to suspend the service between Madrid and Las Palmas (Balearic Islands) because of shortage of equipment, but after several weeks the service was resumed. The company took over four Douglas DC-2 of the former Spanish company L.A.P.E., which were intended

\* A brief reference was made to this work on page 44 in our issue of July 11 last.



to replace the Junkers Ju52 used by the Iberia company, but these have not been sufficient, and the company is reported to have bought four more Ju 52. Iberia is also said to be negotiating with the United States for transport aeroplanes.

#### French Aviation Changes

A new banking concern has recently been founded in Paris under the name of the Aero-Banque with a share capital of fr. 200,000,000, corresponding to RM. 10,000,000. The composition of the board reveals that the bank is an offshoot of German aviation interests; the Chairman is Fritz Rudolf, General Manager of the Bank der Deutschen Luftfahrt Aktiengesellschaft of Berlin, the Vice-Chairman is Dr. Carl Schafer of Paris, and the General Manager is Walter Winkler also of Paris. The bank, the initial capital of which is rather considerable from the French viewpoint, thus represents German interests "co-operating" in French civil aviation, both in France and French overseas areas, and seems to be virtually a branch of the Berlin bank.

According to *Journal Officiel* giving particulars of the new Air Statute, the working of the new scheme will be facilitated by the cancellation within the course of the current year of all civil air

transport concessions. Civil aviation is to be placed under a Secretary of State for Air Navigation. Licences and concessions are to be granted only to concerns maintaining air services between France and foreign countries or French territories overseas, or between the latter and foreign countries. All other concerns operating air services, such as those within France, will require "authorisations." Concessions will be granted only to concerns domiciled in France or French-controlled areas, and with an eye to racial discrimination; the maximum duration will be fifteen years. Authorisations will be granted for a maximum of ten years only. Mail contracts may be concluded with both concessionaires and authorised concerns for a maximum period of five years. Companies holding licences which will be cancelled under the provisions of the new statute are to be indemnified both for the loss of the period between the date of cancellation and the expiring date of the concession, and also for their aircraft and other equipment, which will be taken over by the State.

French air services operating regularly at present are: Vichy-Lyons - Marseilles - Toulouse - Vichy; Marseilles - Algiers; Marseilles - Ajaccio; Marseilles - Algiers - Dakar; Algiers - Tunis; Algiers-Casablanca; and local lines in French West Africa.

### Institute of Transport Luncheon The Minister of War Transport's Address

Lord Leathers, the Minister of War Transport, was the guest of honour at a luncheon held by the Institute of Transport at the Connaught Rooms, London, W.C.1, on November 12. Mr. J. S. Nicholl, C.B.E., President of the Institute, was in the chair.

Lord Leathers, in the course of his address, dealt with the merger of the Ministries of Shipping and Transport to form the Ministry of War Transport, and stressed the word "war" in the name of the new ministry. The Government had thus clearly expressed that all forms of transport must be organised and run as a weapon for war purposes; where peacetime practices conflicted with those purposes they had to be swept aside.

The Minister went on to refer to the promises of aid to Russia and said that they would be redeemed to the full; he had assessed the amount of shipping that was required and there would be no shortage of tonnage to fulfil our promises. One of the routes to Russia lay across Persia and the most strenuous efforts were now being made to increase the carrying capacity of this route, and in this work the British railways were providing aid in power, plant, locomotives, and wagons.

The transfer of transport from an instrument of peace to an instrument of war had progressed far; ideas of priority had been brushed aside and it was now necessary to put goods before passengers. A first and obvious step had been the curtailment of passenger facilities on the railways, and as an indication of how far this had gone already he mentioned that the average frequency of main-line service was about 25 per cent. less than in peacetime. In order to cope with the greatly increased pressure on the railways this winter the Ministry was bound to introduce a further general curtailment of passenger services, and this restriction might be severe on sections of the line where the pressure was greatest. On the other hand, the railways had already this year run 30,000 special military trains and 8,500 special coal trains; they were now carrying more coal for consumption in this country than at any time in their history.

Another essential was the supply of all needs from the nearest available source; with the aid of his colleagues in other departments he was endeavouring to prevent goods being sent long distances

when similar goods could be obtained nearer at hand. Co-ordination of all forms of transport was proceeding; as far as concerned sea transport, in British ships and those on charter from our allies and friends, the Government had full control, and similar control of all movements by land was rapidly becoming a reality.

Lord Leathers, after paying a warm tribute to the late Mr. Frank Pick, and said that all in transport had suffered a profound loss, concluded with a word on postwar plans, and said that the importance of preparing for a postwar transport policy must not be forgotten; much of what was happening in home transport now, necessitating a sensible working together of rail, road, and water carriage, should prove useful in planning for a sound system of national transport in the future. He asked all sections of the great transport industry, including those responsible for civil aviation, to be ready to give their fully considered contribution to these forward problems when they were invited to do so.

Among those present were Messrs. T. E. Argile, A. W. Arthurton, H. S. Aspinall, R. P. Biddle, C. A. Birchell, F. G. Bristow, Lt. Colonel F. Bustard, Messrs. M. A. Cameron, R. Carpmel, A. L. Castleman, B. W. C. Cooke, H. M. Cleminson, F. W. Crews, H. H. Crow, Ashton Davies (a Vice-President), G. Cole Deacon, H. C. Drayton, C. E. W. Duley, E. D. Eastaway, J. Elliott, H. Elliott, W. J. Elliott, G. Ellison, Evan Evans, E. Falconer, N. D. Fawcner, M.C., I. Fraser, G. F. French, S. E. Garcke (Past President), W. H. Gaunt, C.B.E., P. E. R. Graefe, A. E. Hammett, A. Hastie, Sir Maxwell Hicks, Messrs. H. E. Hedges, R. H. Hill, Sir Cyril Hurcomb (Past President), Messrs. E. Huskisson, R. C. Inglis, J. A. Kay, R. Kelso, A. E. Kirkus, F. W. Lampitt, the Rt. Hon. Lord Leathers (Minister of War Transport), Mr. Ronald Leslie, Colonel J. J. Llewellyn (Parliamentary Secretary, Ministry of War Transport), Messrs. F. Lydall, De Maltglave, Sir Lynden Macassey (Past President), Brig.-Gen. Sir Osborne Mance, Messrs. J. T. Masterton, E. J. Missenden (a Vice-President), Lt.-Colonel Sir Alan Mount, Admiral Muselier (Commissioner, Free French Navy & Merchant Marine), Messrs. C. H. Newton, L. H. K. Neil, Air Vice-Marshal H. R. Nicholl, Messrs. J. S. Nicholl (President), J. B. Osler, E. E. Painter, J. Paterson, A. J. Pearson, W. M. Perts, J. Pike, G. J. Ponsonby, Sir William Prescott, Messrs. Fleetwood C. Pritchard, W. H. J. Pyne, A. S. Quartermaine, Sir Alfred Read, Messrs. R. M. T. Richards, V. A. M. Roberts, Gleeson E. Robinson, Sir Thomas Royden, Messrs. T. W. Royle, M. Salt, C. J. Selway, A. E. Sewell, Roger W. Sewill, J. E. Sharpe, L. H. Short, Frederick

Smith, D. G. Sofio, R. O. Squarey, P. W. Swindells, Percy Syder, G. S. Szlumper (Past President), J. P. Taylor, T. E. Thomas (Past President), Sir William Thomson, Messrs. F. W. Tipton, R. H. Tolerton, Sir Herbert Walker, Messrs. Alex. J. Webb, H. E. O. Wheeler, Capt. Wietzel (Director, Free French Mercantile Marine), Mr. W. A. Willox, Sir William Wood.

### Railway Stockholders in Northern Ireland

In the Ulster Senate on November 4 Senator Thomas M'Laughlin asked the Leader of the House whether it was a fact that all the railways in Great Britain were being guaranteed or subsidised to the amount of £40,000,000 a year, and whether the Northern Ireland Government would make representations to the Imperial Government to the end that railways in Northern Ireland were treated on a parity with the railways in Great Britain?

Senator M'Laughlin said it was a well-known fact that in Northern Ireland they had a Transport Act, and that the British Government gave the Northern Ireland Government a sum of £200,000 a year towards its transport undertaking, but the railways got none of that. The railways in Northern Ireland were giving just as much service to the British Government in its war aims as any of the railways in Great Britain. Therefore he appealed to the Northern Ireland Government to see that at least the stockholders of railways in Northern Ireland were treated in a similar manner as those in Great Britain.

Mr. J. H. Robb, K.C., Leader of the House, said it was not quite correct to say that the British Government was subsidising railways in Great Britain. The Government assumed control, practically, of the railways of Great Britain and placed them under the control of the Minister of War Transport. The railways of Northern Ireland were still in the control and management of their owners, and, although the Army had first claim on their use, the right of that claim was established by an arrangement on a commercial basis in respect of traffic, which was a lucrative source of revenue to the railways, and not by Act of Parliament. The Government of Northern Ireland had no power to assume control of the railways of the Province, and nothing had arisen at any time during the past two years which would indicate that such control was necessary. In the circumstances it was not the intention of the Northern Ireland Government to suggest to the British Government that such a step should be taken.



## NOTES AND NEWS

**Canadian Stock Repatriation.**—Repatriation of the stock issued by the Grand Trunk Railway is practically completed, and a reduction of at least \$5,503,000 will be effected in the outstanding debt of the Canadian National Railways. The total outstanding was £24,624,000, and repatriations have amounted to some £23,000,000 to date.

**York Model Railway.**—The York Parks Committee has granted permission to the York & District Society of Model Engineers to construct a model railway track in Rowntree Park for the society's own use, on the understanding that the corporation accepts no responsibility in the matter, and that any money which the society may receive from charges for using the track be given to some charity approved by the York Parks Committee.

**Air Lines in Brazil.**—Panair do Brazil, S.A., is required, by a Decree of July 25, 1941, to operate without subsidy or other Government aid a minimum of one flight weekly in each direction over the following routes:—

- (1) Rio de Janeiro-Sao Paulo-Curitiba  
Fos do Iguaçu-Asuncion-Corumba  
Campo Grande-Sao Paulo-Rio
- (2) Rio-Bello-Horizonte Patos-Goinia

It is the responsibility of Panair to obtain the authorisation of the Paraguayan Government to fly over Paraguay.

**Great Southern Railways (Eire).**—For the 44th week of 1941 the Great Southern Railways Company reports passenger receipts of £39,296 (against £29,512), and goods receipts of £73,971 (against £59,475), making a total of £113,267, against £88,987 for the corresponding period of the previous year. The aggregate receipts to date are passenger £1,766,546 (against £1,568,122), goods £2,353,383 (against £2,100,832), making a total of £4,119,929 (against £3,668,954).

**B.S. Specification for Clockwork Gears.**—A British Standard Specification (B.S. No. 978) has been issued for gears for clockwork mechanisms, which term includes clocks, watches, meters and instruments of various kinds, so enabling the number of hobs needed to be reduced, many hundred types being previously in use. The circular arc form of tooth has been selected, so as to reduce the number of tools required. Copies may be obtained from the British Standards Institute, 28, Victoria Street, London, S.W.1, price 2s. 3d. post free.

**The Italian Motor Roads in 1940.**—The year 1940 proved unsatisfactory for the companies operating Italian motor roads, as a result of the drastic curtailment of motor traffic due to shortage of fuel. The company operating the motor road between Milan and Turin (78 miles, or 126 km.) Italy's longest motor road, reported a cumulative loss of lire 13,700,000; the losses for 1939 and 1940 were lire 954,200 and lire 479,900 respectively. The company's share capital is lire 29,700,000. The motor roads Milan-Bergamo (30 miles, or 48.6 km.) and Florence-Viareggio (51 miles, or 82 km.) were taken over by the State in 1940, due to the hopeless financial position of the companies. Only the Naples-Pompeii motor road showed satisfactory financial results for 1940.

**G.W.R. Mobile Canteen.**—We are informed by John I. Thornycroft & Co. Ltd. that the G.W.R. mobile canteen

illustrated at page 475 of THE RAILWAY GAZETTE of November 7 is drawn by that undertaking's Nippy Class 3-ton tractor chassis fitted with Scammell 6-ton automatic coupling gear.

**Locomotive Hammer-Blow and Balancing.**—It is announced that at a meeting of the Institution of Civil Engineers to be held on Tuesday, December 16, at 2.30 p.m., two papers will be presented jointly with the Institution of Mechanical Engineers. The papers are entitled "The Elimination of Locomotive Hammer-Blow" and "The Balance of Locomotive Reciprocating Parts." The authors of the first are Sir Harold N. Colam and Mr. J. D. Watson; Mr. E. S. Cox is the author of the second.

**Kerry Rail Accident.**—On the morning of November 10 an accident occurred to the 3.35 a.m. goods train from Tralee to Valencia. Due to heavy rain on November 9, the countryside was flooded. The Farranfore river burst its banks after sweeping away bridges further up country. At a bridge spanning a paved cattle pass,

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One ton of paper can be turned into any of the following:—

- 1,500 shell containers
- 9,000 shell fuse components
- 11,000 mine assemblies
- 71,000 dust covers for aero engines
- 36,000 cut-out targets
- 3,000 boxes for aero-cannon shells

refuse caused a block, and the embankment was washed out, leaving the rails sagging. When the train reached the bridge the train fell through and most of the wagons were piled up on top of the engine. The driver and fireman lost their lives. Bus and lorry service was provided from Tralee, but the main goods traffic had to be diverted via Limerick.

**New Danish Ferry Ship.**—A twin-screw passenger and motorcar ferry ship, the *Marsh Stig*, has been completed recently at the Aalborg Shipyard for the Grenaa-Hunested Ferry Company's night service across the Kattegat. The vessel is of 1,107 gross tons, draws 131 ft., and has a carrying capacity of 800 passengers and 60 motorcars. Accommodation includes sleeping cabins for 125 passengers. The whole of the main deck is allocated to private cars, lorries and buses, which are driven on board through a large doorway in the stern of the ship.

**Buenos Aires Transport.**—An agreement between the Buenos Aires Transport Corporation and the CHADOPYF (Compania Hispano Argentina de Obras Publicas y Finanzas) was signed on November 6, according to the Argentine News Bulletin published by Leng Roberts & Co. (London). The agreement is subject to the approval of the National Government, the competent authorities of the two undertakings, and the CHADOPYF debenture holders. It covers valuation of CHADOPYF assets, the method of payment for them by the Transport Corporation, and the exchange of debentures.

**Panama Air Traffic.**—The number of incoming and outgoing passengers cleared through the Panama Canal Zone airports in the 12 months ended June 30, 1941,

totalled 21,020—an increase of 62 per cent. over the 12,981 recorded for the preceding financial year. The following figures all show considerable increases. Air express and mail carried, 1939-40, 361,868 lb.; 1940-41, 655,401 lb.; increase, 293,533. Passengers cleared, 1939-40, 12,981; 1940-41, 21,020; increase, 8,039. Aircraft cleared from Canal Zone airports, 1939-40, 2,840; 1940-41, 4,670; increase, 1,830. The figures for 1940-41 include all aircraft in regularly-scheduled airline services, plus private civil aircraft of United States and foreign registry and foreign military aircraft. At present the passenger schedules for air transport lines serving the area are stated to be inadequate, but immediate improvements in this situation are improbable, owing to the inability of air lines to obtain additional equipment.

**Failure to Fire Watch.**—Twenty-one employees of the Great Northern Railway Company in Belfast were summoned at Belfast Police Court for failing to firewatch. In the case of four of the men Mr. Millar, Resident Magistrate, held that no offence had been committed and dismissed the summonses. Mr. Chambers, for the defence, had submitted that the "premises" where the four men were required to fire-watch were not premises to which the fire-watching order applied. On the other summonses, the R.M. reserved his decision. For the company it was stated that their fire-watching scheme had been approved by the Ministry of Public Security and that equipment was provided. For the defence it was submitted that the men were not consulted in the making of the scheme; that equipment was inadequate; that the 1s. 6d. allowance a night which the men were allowed was too low; that compensation was lower than in the English railway companies; and that the roster did not take account of the long hours worked by the men. It was also submitted that the scheme was not binding on the men as it had not their approval.

**American Motors in South Africa.**—Registration of new motor vehicles in the City of Johannesburg showed a large increase in July, 1941, over the same month of last year, numbering 462 passenger cars (439 American) and 92 lorries and buses (87 American), compared with 157 passenger cars (120 American) and 33 lorries and buses (28 American) in July of last year. This brings the total number of new motor vehicles registered in 1941 to 2,963 passenger cars and 517 lorries and buses, against 2,256 and 353 respectively in the first seven months of 1940. Registrations of new motor vehicles in the Union of South Africa numbered 9,972 passenger cars, 2,334 lorries and buses, and 156 motor cycles, in the first five months of 1941, against 10,140, 2,160, and 532, respectively, in the same period of 1940. Increases were noted in passenger car registrations in the Provinces of Natal and Transvaal and of lorries and buses in Transvaal and Orange Free State. The number of new motor vehicles licensed in May, 1941, totalled 1,793 passenger cars (1,711 of United States origin), 560 lorries and buses (546 United States) and 13 motorcycles (4 United States), compared with 1,489 passenger cars (1,229 United States), 423 lorries and buses (402), and 83 motorcycles (0), in the corresponding month of 1940.

## Forthcoming Meetings

Nov. 26 (Wed.).—*Companhia de Mocambique* (adjourned ordinary general), 10, Largo da Biblioteca Publica, Lisbon, at noon.

## Questions in Parliament

Below are summarised Answers to Questions in Parliament affecting transport. The Minister concerned and the date of the Answer are given in parentheses.

### Reading Railway Service

From Paddington, 35 trains run each weekday to Reading. Of these, 22 which proceed to destinations beyond Reading carry first class passengers. The average daily number of these passengers is 972. From Waterloo, 23 trains run to Reading daily. On all these there is first class accommodation. On October 24 when a count was taken 152 first class passengers travelled to destinations on this route. (Colonel J. J. Llewellyn, Joint Parliamentary Secretary, Ministry of War Transport, November 11.)

### Travel Facilities Advertisement

The notice issued by the Southern Railway Company advertising cheap fares and reserved accommodation for parties and special trains and fares for large parties, and offering to supply suggestions for tour outings and collecting cards for outing subscriptions, is out of date, and is taken out of carriages as they go into depots for servicing. (Colonel Llewellyn, November 11.)

### Free Railway Warrants

A considerable number of Government Departments or organisations and various local authorities issue warrants or bulk travel vouchers which can be exchanged for rail tickets without payment at the time of booking. I have no complete information about the persons to whom warrants or vouchers are issued, as such issues are matters for the various Departments concerned. (Colonel Llewellyn, November 11.)

## Staff and Labour Matters

### Military Service—Deferment of Calling Up

The Ministry of Labour & National Service has announced that, to assist in meeting the man-power requirements of the Armed Forces, it has been decided that, except for men engaged in certain specified essential occupations, no further deferment of calling up should be granted to men who, on the date on which they were due to register under the National Service Acts, were under the age of 25, and that current deferment in respect of these men should be cancelled. To allow time for employers to make necessary arrangements, the cancellation of the deferments of the men concerned will take effect on the following dates:—

December 1, 1941: Men aged 19 at date of registration, in occupations reserved at age 21.

Men aged 19 and 20 at date of registration, in occupations reserved at age 23.

Men aged 19 to 21 at date of registration, in occupations reserved at age 25 and over.

January 1, 1942: Men aged 20 at date of registration, in occupations reserved at age 21.

Men aged 21 and 22 at date of registration, in occupations reserved at age 23.

Men aged 22 to 24 at date of registration, in occupations reserved at age 25 and over.

Individual employers will be notified of employees affected by this decision and the date on which cancellation of deferment will take place. Occupations which are covered by special schemes, such as in agricultural and coal mining industries, remain unaffected by the above decision.

Railway occupations in respect of which deferment of calling up may continue to be granted to men under 25 years of age include traffic control staff, engine driver, fireman, motorman, engine cleaner qualified fire-

man, ganger, sub-ganger, lengthman, re-layer platelayer, patrolman, wireman, fixer, porter qualified signalman, porter qualified guard, porter qualified shunter, guard, porter-guard, conductor, train attendant, brakeman, inclineman, signalman, porter-signalman, traffic regulator, and shunter.

### Schedule of Reserved Occupations

Amendments in the Schedule of Reserved Occupations & Protected Work recently announced by the Ministry of Labour & National Service include any railway worker certified by a railway company as qualified to be employed as guards, signalmen or shunters who are now reserved at the ages of reservation applicable to men actually employed in these occupations.

### Engineering Wages—Women

Female workers in the engineering industry will receive increases of 3s. a week for those aged 18 years, rising to 5s. a week for those aged 21 years and over as from November 16, under an agreement concluded on November 6 between the Engineering and Allied Employers' National Federation and the National Union of General and Municipal Workers and the Transport & General Workers' Union. The new rates of pay for female workers in the engineering industry are as follows:—

Age.	Basic rate	War wage	Total
18 years ...	5s.	5s.	10s.
19 " ...	21	18	39
20 " ...	23	18	41
21 " and over ...	25	18	43

### Engineering Wages—Boys and Youths

A claim by the Transport & General Workers' Union and the National Union of General & Municipal Workers against the Engineering & Allied Employers' National Federation for increases in the rates of pay of boys and youths, other than apprentices, under the age of 21 years employed in the Engineering industry has been rejected by the National Arbitration Tribunal in Award No. 146.

## Railway and Other Reports

### Ottoman Railway Holding Co. Ltd.

—Only one half-year's interest on the company's holding of £707,950 Turkish 7½ per cent. 1935 bonds or £26,548 gross was received during the year ended June 30, 1941, but a like amount was received on October 23, which will be available for next year's accounts. After providing for management expenses, taxation, and interest on advances, the balance of net profits of the year is £19,720 compared with £28,970 last year. Deducting £18,048 for interest at 2½ per cent. less tax, on the outstanding stocks, there is a balance of £1,671 available for interest on or for redemption of the income debenture stocks.

**Hants & Dorset Motor Services Limited.**—The interim dividend is 4 per cent. tax free, the same as a year ago.

## Contracts & Tenders

The Central Railway of Brazil is reported to be enquiring for a total of 54 passenger train coaches comprising 18 3-coach electric trains.

The Union Pacific Railroad has placed an order with the Electro-Motive Corporation for 25 diesel-electric shunting locomotives of 1,000 h.p. each, for use in important terminals. Each of the locomotives will be nearly 45 ft. long, weigh 125 tons, and be equipped with one General Motors 12-cylinder diesel engine. Delivery

is expected at the rate of six locomotives a month beginning in April, 1942. The cost of the order is estimated at about \$2,000,000.

In THE RAILWAY GAZETTE of September 12, it was reported that the Canadian Car and Foundry Company was working on an order for 2,500 box wagons for the South African Railways and Harbours. We have now ascertained from our Canadian correspondent that the order referred to was for 2,000 open high-sided steel bogey wagons and that the total was made up of two orders of 1,000 wagons each.

## British and Irish Railway Stocks and Shares

Stocks	Highest 1940	Lowest 1940	Prices	
			Nov. 14, 1941	Rise/ Fall
G.W.R.				
Cons. Ord. ....	52	22½	40	— ½
5% Cons. Pref. ....	103½	58	103½	—
5% Red. Pref. (1950) ..	105½	88	103	—
4% Deb. ....	107½	90½	112½	—
4½% Deb. ....	108½	96½	113	—
4½% Deb. ....	114½	96	117½	—
5% Deb. ....	124	106	130	—
2½% Deb. ....	66½	57	67	—
5% Rt. Charge ....	117½	97	127½	—
5% Cons. Guar. ....	117	90½	126½	+ 1
L.M.S.R.				
Ord. ....	24½	9	15½	—
4% Pref. (1923) ....	60½	21½	48½	—
4% Pref. ....	70½	35	63½	+ 1
5% Red. Pref. (1955) ..	94½	60	91½	—
4% Deb. ....	101	81	104½	—
5% Red. Deb. (1952) ..	109½	102	109½	—
4% Guar. ....	93½	65	96½	+ 1
L.N.E.R.				
5% Pref. Ord. ....	8½	1½	3	+ ½
Def. Ord. ....	4½	1½	—	—
4% First Pref. ....	60	20	47½	—
4% Second Pref. ....	22½	4	17½	+ 1
5% Red. Pref. (1955) ..	80	34½	76½	—
4% First Guar. ....	86½	56	88½	+ 1
4% Second Guar. ....	77½	37	77½	+ 2
3% Deb. ....	73½	54½	77½	—
4% Deb. ....	97½	74	103½	—
5% Red. Deb. (1947) ..	107	96½	103	—
4% Sinking Fund Red. Deb. ....	104	98	102½	—
SOUTHERN				
Pref. Ord. ....	79	34	61½	—
Def. Ord. ....	22½	7	13½	+ 1 ½
5% Pref. ....	104½	58½	102½	+ 1
5% Red. Pref. (1964) ..	105	85	104½	+ 1
5% Guar. Pref. ....	114½	90	126½	+ 1
5% Red. Guar. Pref. (1957) ....	114½	94	112½	—
4% Deb. ....	106½	84½	110½	—
5% Deb. ....	122½	100	127½	—
4% Red. Deb. (1962- 67) ....	106	96½	106	—
4% Red. Deb. (1970- 80) ....	106½	93	106	—
FORTH BRIDGE				
4% Deb. ....	95½	87	96½	—
4% Guar. ....	93½	81½	97½	—
L.P.T.B.				
4½% "A" ....	116	103	117½	—
5% "A" ....	121½	107	129	—
4½% "T.F.A." ....	105½	101	101½	—
5% "B" ....	116	102	116½	—
"C" ....	65½	24	41	+ 1
MERSEY				
Ord. ....	26	18½	20½	—
4% Perp. Deb. ....	92½	84½	99½	—
3% Perp. Deb. ....	68	63	72½	—
3% Perp. Pref. ....	57	50½	56	—
IRELAND BELFAST & C.D.				
Ord. ....	4	3	4	—
G. NORTHERN				
Ord. ....	4½	1½	14	+ 1½
G. SOUTHERN				
Ord. ....	12½	4	10	+ ½
Pref. ....	15½	6	14	+ 1½
Guar. ....	36	15	30	+ 1½
Deb. ....	55½	40	59	+ 2½

## Railway Stock Market

Stock Exchange markets have taken on a quieter aspect in the absence of further recovery in the volume of business, although last week's improvement in security values has induced very little selling. The general undertone remained firm, and all classes of stocks and shares continued in short supply, including many of the more speculative issues. Among the latter, profit-taking prevented Argentine railway preference and ordinary stocks from maintaining all their recent improvement, although in other directions many of the debentures were little changed on balance, and there was general willingness to take the long view, awaiting resumption of interest payments. Expectations that during the present session of Parliament, the Bill dealing with the war damage scheme in respect of public utility companies will be introduced, maintained firmness in home railway stocks. The prior charges remained very firm with stock in small supply, but some of the higher-yielding guaranteed and preference stocks were in better request and have moved to improved prices at the time of writing. On the other hand, increased demand failed to develop for the junior stocks, due partly to the surrounding tendency on the Stock Exchange. Nevertheless, should the war damage scheme for public utility concerns

tend to bear out the prevailing view that there are reasonable prospects of dividends being maintained, the junior stocks would doubtless come in for increasing attention as time proceeds, bearing in mind that the yields are well in excess of those obtainable on many other groups of equity securities. It is true, of course, that the contingency of air raid damage does not enter into the valuation of stocks of the South American railways, but in comparison with many of the latter, junior stocks of the home railways would appear to be moderately valued. Southern deferred, for instance, is only four points above B.A. Gt. Southern ordinary, and the latter cannot be regarded as offering any early prospect of a return to the dividend list.

Great Western ordinary stock has been slightly reactionary, and at 40 at the time of writing shows a decline of half-a-point on balance. The 5 per cent. preference continued in better request, and further improved from 104 to 105; the guaranteed stock was 126½, and the debentures remained firm at 112½. L.M.S.R. issues appeared to be rather more active in some instances, although the ordinary stock was 15½, compared with 15½ a week ago. L.M.S.R. senior preference was favoured on the yield and investment merits, and the price rose further from 63 to 64½; the 1923 preference was fractionally higher at 48½.

L.M.S.R. guaranteed stock continued in request and gained a point to 97; the 4 per cent. debentures were firm at 105. Among L.N.E.R. issues, the investment merits and good yields offered by the guaranteed stocks attracted attention; on balance, the first guaranteed has improved from 88 to 88½, and the second guaranteed from 76½ to 78½. L.N.E.R. first preference was half-a-point better at 47½, and the second preference moved up from 16½ to 17½. L.N.E.R. 4 per cent. debentures were firm at 103, as were the 3 per cents. at 78. After an earlier decline, Southern preferred came into request, and at 61½ was unchanged on balance; the deferred stock was 13½, compared with 13½ a week ago. Buyers were in evidence for Southern 5 per cent. preference, which was fractionally better at 103, and the 4 per cent. debentures remained firm at 111. London Transport prior charges held their recent good gains, and the "C" stock moved to 42, an improvement of two points.

At one time sentiment as to Argentine railway stocks was affected by consideration of the Central Argentine annual figures, which tended to emphasise the marked recovery that will have to be made before dividends on the junior stocks can be resumed. Ordinary and preference stocks lost part of their recent improvement, but as in most other directions, the debentures were fairly steady.

### Traffic Table of Overseas and Foreign Railways Publishing Weekly Returns

Railways	Miles open 1940-41	Week Ending	Traffic for Week		No. of Weeks	Aggregate Traffic to Date			Shares or Stock	Prices				
			Total this year	Inc. or Dec. compared with 1940		Totals		Increase or Decrease		Highest 1940	Lowest 1940	Nov. 14, 1941	Yield % (See Note)	
						This Year	Last Year							
South & Central America	Antofagasta (Chili) & Bolivia	834	9.11.41	£ 21,010	+ £ 9,220	45	£ 869,240	£ 757,690	+ £ 111,550	Ord. Stk.	11½	3½	10	Nil
	Argentine North Eastern ...	753	8.11.41	ps. 186,700	+ ps. 44,700	19	ps. 3,783,600	ps. 3,243,700	+ ps. 539,900	"	3½	1	3	Nil
	Bolivar	174	Oct., 1941	3,650	+ 470	43	38,504	39,150	- 646	6 p.c. Deb.	8	5	7½	Nil
	Braz.									Bds	8	5	7½	Nil
	Buenos Ayres & Pacific	2,801	1.11.41	ps. 1,320,000	+ ps. 230,000	18	ps. 22,980,000	ps. 20,104,000	+ ps. 2,876,000	Ord. Stk.	4½	1	7½	Nil
	Buenos Ayres Great Southern	5,082	1.11.41	ps. 2,319,000	+ ps. 272,000	18	ps. 37,823,000	ps. 33,668,000	+ ps. 4,155,000	Ord. Stk.	10½	3	10	Nil
	Buenos Ayres Western	1,930	1.11.41	ps. 934,000	+ ps. 211,000	18	ps. 14,777,000	ps. 11,406,000	+ ps. 3,371,000	"	8½	2	7½	Nil
	Central Argentine	3,700	8.11.41	ps. 1,774,750	+ ps. 458,000	19	ps. 34,876,700	ps. 26,380,800	+ ps. 8,495,900	"	8½	2	7½	Nil
	Do.									Dfd.	4	½	2½	Nil
	Cent. Uruguay of M. Video	972	1.11.41	26,446	- 1,137	18	400,110	343,235	+ 56,875	Ord. Stk.	3½	1	3	Nil
	Costa Rica	188	Sept., 1941	21,437	+ 5,073	13	68,996	57,220	+ 11,776	"	23½	14	12	16½
	Dorada	70	Oct., 1941	10,220	- 1,480	43	122,970	122,400	+ 570	1 Mt. Db.	99	97½	97	6½
	Entre Rios	808	8.11.41	ps. 262,300	+ ps. 61,800	19	os. 5,499,400	ps. 4,431,600	+ ps. 1,067,800	Ord. Stk.	4	½	6½	Nil
	Great Western of Brazil	1,016	8.11.41	16,300	+ 2,500	45	430,600	456,000	- 25,400	Ord. Sh.	4½	1½	7½	Nil
	International of Cl. Amer.	794	Sept., 1941	\$367,431	+ \$41,642	39	\$4,257,101	\$4,405,419	- \$148,318	"	4½	1½	7½	Nil
	Interoceanic of Mexico									1st Pref.	9d.	9d.	½	Nil
	La Guaira & Caracas	224	Oct., 1941	7,445	+ 650	43	65,445	67,095	- 1,650	"	6	4	½	Nil
	Leopoldina	1,919	1.11.41	29,837	+ 3,274	44	1,159,049	1,009,906	+ 149,143	Ord. Stk.	2½	1	4½	Nil
	Midland of Uruguay	483	7.11.41	ps. 270,300	+ ps. 52,400	18	ps. 5,594,400	ps. 4,944,800	+ ps. 649,600	"	2½	1	4½	Nil
	Nitrate	319	Sept., 1941	13,499	+ 1,530	13	40,979	33,560	+ 7,419	"	2½	1	4½	Nil
Paraguay Central	386	31.10.41	7,814	+ 1,827	43	122,844	146,673	- 23,829	Ord. Sh.	24	1	3	4½	
Peruvian Corporation	274	8.11.41	\$3,059,000	+ \$432,000	19	\$63,537,000	\$65,440,000	- \$1,903,000	Pr. Li. Stk.	41	36	42½	7½	
Salvador	1,059	Oct., 1941	73,593	+ 6,715	17	292,346	265,325	+ 27,021	Pref.	4	1	6	Nil	
San Paulo	100	Aug., 1941	c47,093	+ c11,877	9	c111,172	c86,683	+ c24,489	"	50	—	—	—	
San Paulo	1534	2.11.41	33,125	+ 1,376	44	1,622,666	1,595,655	+ 27,011	Ord. Stk.	50	23	49½	4½	
Tatall	160	Sept., 1941	7,225	+ 5,050	13	16,390	6,725	+ 9,665	Ord. Sh.	15½	8	12	Nil	
United of Havana	1,346	8.11.41	17,715	+ 3,957	19	359,691	290,026	+ 69,665	Ord. Stk.	8	½	2	Nil	
Uruguay Northern	73	Sept., 1941	1,219	+ 208	13	3,910	2,937	+ 973	"	—	—	—	—	
Canada	Canadian National	23,560	7.11.41	1,326,130	+ 299,578	44	51,140,634	41,306,806	+ 9,833,828	"	86	68	93½	4½
	Canadian Northern	—	—	—	—	—	—	—	—	Perp. Dbs.	105½	95½	101½	3½
	Grand Trunk	—	—	—	—	—	—	—	—	4 p.c. Gr.	9½	9½	12½	Nil
	Canadian Pacific	17,146	7.11.41	931,000	+ 177,600	44	36,938,800	28,502,800	+ 8,436,000	Ord. Stk.	9½	4½	12½	Nil
India	Assam Bengal...	1,329	—	—	—	—	—	—	—	Ord. Stk.	99½	71	100	3
	Barat Light	202	10.9.41	3,105	+ 945	23	80,887	66,780	+ 14,107	"	283	234	307	4
	Bengal & North Western	2,099	Oct., 1941	245,100	- 634	4	245,100	245,734	- 634	Ord. Stk.	96	83½	100½	5½
	Bengal-Nagpur	3,269	10.7.41	222,300	+ 27,943	14	2,552,246	2,417,662	+ 134,584	"	108	99	107½	7½
	Bombay, Baroda & Cl. India	2,986	31.10.41	304,800	+ 22,425	29	6,076,725	5,651,925	+ 424,800	"	104	97½	102½	7½
	Madras & Southern Mahratta	2,939	31.8.41	210,975	+ 49,472	22	3,061,594	2,547,714	+ 513,880	"	284	238	300	5½
	Rohilkund & Kumaon	546	Oct., 1941	48,150	+ 1,105	4	48,150	47,045	+ 1,105	"	93½	83	97½	4½
South Indian	2,500	10.8.41	136,398	+ 13,893	19	1,860,584	1,640,073	+ 220,511	"	—	—	—	—	
Various	Beira	204	July, 1941	74,593	-	43	727,546	—	—	Pf. Sh.	7½	10½	2	Nil
	Egyptian Delta	610	31.7.41	7,912	+ 2,864	18	82,025	56,624	+ 25,401	B. Deb.	53	44½	64	5½
	Manila	—	—	—	—	—	—	—	—	Inc. Deb.	88	80	89½	6½
	Midland of W. Australia	277	May, 1941	17,591	+ 3,683	48	167,924	145,304	+ 22,620	"	—	—	—	—
	Nigerian	1,900	3.8.41	38,550	+ 10,823	22	1,122,822	783,893	+ 338,929	"	—	—	—	—
	Rhodesia	2,442	July, 1941	464,690	-	43	4,682,301	—	—	"	—	—	—	—
	South Africa	13,291	27.9.41	788,722	+ 63,377	26	19,364,720	17,463,590	+ 1,901,130	"	—	—	—	—
Victoria	4,774	July, 1941	955,039	+ 86,611	4	955,039	868,428	+ 86,611	"	—	—	—	—	

Note Yields are based on the approximate current prices and are within a fraction of ½  
† Receipts are calculated @ 1s. 6d. to the rupee

Argentine traffic is given in pesos